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A Sixth Century Account of Hay

(P. land. inv. 653)

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BRUXELLES

FONDATION EGYPTOLOGIQUE REINE ÉLISABETH

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PREFACE

The existence of this document, which has been purchased in 1926 by Professor C. Schmidt at Medinet el Fayûm, has been first mentioned by Dr. J. HUMMEL in his *Griechische Wirtschaftsrechnungen und Verwandtes (Papyri Iandanae, fasc. VIII, Leipzig-Berlin, 1938)*, p. 355, where we read the following note: «Ansehnliche Reste eines Papyruskodex des vi. Jahrhunderts, der das Wirtschaftsbuch eines im Polemonbezirk des Arsinoitengauzes gelegenen grossen Gutes mit mehreren Worwerken bildete (*P. Iand.* Inv.-Nr. 653 A-I), von mir gleichfalls bearbeitet, müssen leider hier ausgeschieden und an anderer Stelle veröffentlicht werden.» During the war Dr. Hummel's notes on *P. Iand.* 653 were destroyed; the papyrus however remained intact and was transferred after the end of the war, together with the other documents of the Janda collection, to the University Library at Giessen. When invited by Dr. H. G. GUNDEL, Curator of the Papyrus Collections of the Giessen University Library, to resume his work on *P. Iand.* 653, Dr. Hummel had to decline this proposal because of professional duties. In 1952 we accepted Dr. Gundel's invitation to publish the so-called *Wirtschaftsbuch* and a small number of other papyri from the Janda collection (1). We had to rely upon Dr. Gundel's patience until we finally found the necessary time to concentrate on our task which, owing to the fragmentary state of *P. Iand.* 653 and its peculiar methods of accountancy, proved to be very complicated. Although we have been unable to find a solution for all the difficulties that are

(1) H. G. GUNDEL, *Kurzberichte aus den Papyrussammlungen der Universitätsbibliothek Giessen*, 9 (1960) pp. 18-19 and note 41. — As the other papyri are dealing with entirely different subjects, and will only require a short commentary, it has seemed preferable not to join them to the publication of the *Wirtschaftsbuch*.

contained in the *Wirtschaftsbuch*, we believe its publication ought not to be delayed any longer. It is our agreeable duty to thank Dr. J. Schawe, Director of the Giessen University Library, for his kind permission to publish this document. We are equally indebted to Professor J. Bingen to whom we owe, in addition to some valuable suggestions, an early printing of our study.

CHAPTER I

THE DOCUMENT

1. Description of the Fragments

The remnants of *P. Iand.* 653 have been skilfully grouped by Dr. H. Ibscher, who succeeded in restoring partly or entirely five strips of papyrus (A, B, C-D (?), E), from which he distinguished four smaller fragments (F, G, H, I). Their measurements will be indicated in the course of our publication.

All fragments are covered, both on recto and verso, with columns whose original width must have varied between 3 cm. and 14 cm. The entire document has been written by a single hand, which may be attributed to the 6th century (cf. Plates I-IV).

On several fragments traces of pricking are visible. They appear very neatly in the left margin of E (cf. Plate I or II: two pairs of little holes), B and A, and again in the middle of C-D (cf. Plate III or IV).

The left edge of fragment E being completely straight (cf. Plate I), there is no doubt that E belonged to the left margin of a papyrus sheet. The other fragments' lateral edges result from desintegration, not from cutting.

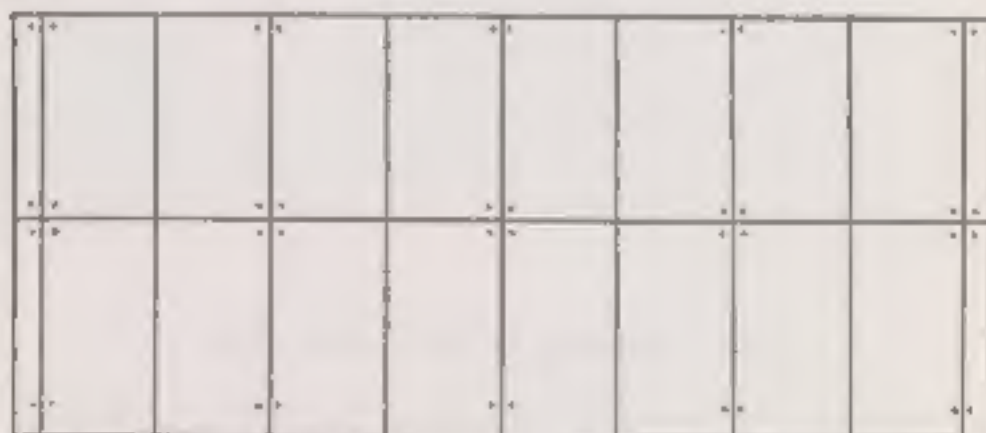
2. The Document in its Original Form

According to his note in *P. Iand.*, fasc. VIII, p. 355, Dr. Hummel seems to have believed that our fragments are the remnants of a papyrus codex. For several reasons this is quite impossible. It will be

(1) Both strips are still connected, at least over part of their height.

sufficient to develop a single argument: according to fragment E the codex would have consisted of a certain number of sheets, fastened together in their left margin, whereas according to fragments C-D the sheets would have been folded into leaves and the codex would have consisted of a number of quires (which, by the way, would have been bound in a very unorthodox and unpractical fashion).

In our opinion the fragments of *P. Iand.* 653 belong to a couple of large sheets, which were folded up individually and sealed. One of these sheets (perhaps both of them) measured 68×29 cm. After it had been written on, its height was reduced to $14 \div 1$ cm. by a horizontal fold at a distance of 15 cm. from the upper edge. Afterwards it was folded lengthwise in two, so that its width was reduced to 34 cm. A second lengthwise fold took place at a distance of 18 cm. from the left edge (resulting width: $16 \div 2$ cm.), and after a third lengthwise fold the width of the sheet was narrowed to $8 \div 2$ cm. The 2 cm. margin (lateral margin), which has partly survived in fragment E, did duty as a flap. The document was pricked for sealing close to its top and bottom. If it had been preserved entirely the sheet would look, after being unfolded, as follows:



In the course of our study we have mainly been working on excellent photographs, provided by Dr. Gundel. Before we had the opportunity to check our results on the original, we were inclined to believe that

all fragments belonged to a single sheet. Our inspection of the original proved, however, that Dr. Hsicher had had good reasons to put together fragments F-I and to distinguish them from fragments A-E. Fragments F-I are of a slightly darker colour than the other pieces, and their breaks and gaps do not coincide with those that are found in fragments A-E. They consequently cannot have belonged to the same sheet as A-E.

The papyrus sheet which disintegrated into fragments F-I is difficult to restore. It probably was folded and pricked in a similar way as the sheet that has been described above. Fragments F and I seem to have belonged to the lower half of the sheet, fragment G to the upper half. We shall publish these fragments in their alphabetical order. As will be seen on p. 12, the F-I sheet very probably preceded the A-E sheet.

The repartition of fragments A-E over the second sheet can easily be established. Because of the triple lengthwise folding, the sheet has been divided into eight sections (width 8 cm.), preceded and followed by a 2 cm. margin. Although this sheet has suffered less damage than the previous one, substantial parts of it are missing:



Initial 2 cm. margin : upper half preserved in fragment E.

1st section : upper half preserved in fragment E.

2nd section : completely lost.

3rd section: as far as its writing is concerned, almost completely preserved in fragment B.

4th section: upper half and part of lower half preserved in C.

5th section: ident. in fragment D.

6th section: completely lost.

7th section: almost completely preserved in fragment A.

8th section: completely lost.

Final 2 cm. margin: completely lost.

All sections have been separated one from another by corrosion, except the initial 2 cm. margin, which is still connected with the 1st section, and sections 4 and 7 (cf. Plate III or IV), which form the central part of this sheet.

3. Survey of the Contents

P. Ind. 631 is an account of receipts and expenditure of hay. Our document has been written in the accountancy office of a private estate; it deals, at least in principle, with the 8th year of an indiction cycle. The provisions of hay were obtained from various sources (local production, related domains, purchases) and fed to different troops of animals. Hay also served as a means of exchange in trade.

The units of weight and capacity, used in these transactions, are the following: *deposia*, lb (double); *pinog* (load, containing 50 pounds-*les*), *proior* (measure of capacity, containing 2 loads).

The accounts of receipts are dealing exclusively with hay that was delivered to the domain in the course of the 8th year. Two classes of accounts will have to be distinguished. The first class records deliveries that were made by producers, e. g. 112, 1: *ἀγογὸς γόστου Φίπλου* (according to 1121, 1) (this was a *proiogete*). Deliveries of the second class were effected by *αγογῆται*, i.e. stablemen of the estate (donkey-drivers and muleteers), cf. e. g. 117, 1: *ἀγογὸς Ἰουκίου ἀγογῆται*.

(1) Although this term seems very frequently always to abbreviate, our reading is not certain. Whatever the solution of the abbreviation may be, it certainly meant 'pupils'. Several examples of the abbreviation will be found on Plates III-IV. It is written in slightly different ways.

The first class of accounts of receipts deals with deliveries for various purposes, the second class always concerns provisions which would be consumed by a single troop of animals. There is a further distinction between the two classes: deliveries of the first class are usually dated, those of the second class on the contrary not. It is not clear where the *stratēgos* obtained the provisions that are listed in the second class.

The accounts of expenditure are equally to be subdivided into two classes. The first class deals with expenditure made during the 8th year in trade operations (chartera). Only one account of this kind has been preserved (II 15). Accounts of expenditure of the second class relate the keeping of animals on hay, and usually contain the following items: kind and number of animals — daily ration per head — daily consumption of the troop in question — period during which hay was fed — total consumption — receipts for the following period. A few accounts (II 14, II 21) mention, after the total of consumption, a total of receipts and their surplus. Most of the accounts of feeding expenditure deal with a period starting on 1st, 5th or 7th Pharmouthi, and ending on 11th, 15th or (most frequently) 30th Payni. These are the accounts which contain, at the end, of survey of receipts for the following period⁽¹⁾, whose items are not mentioned in any of the accounts of receipts, for the simple reason that the deliveries in question were made after the end of the 8th year (2). In his accounts of feeding expenditure the author consequently anticipates his accountancy of the 9th year. As this year has nowhere been explicitly mentioned by our author, this peculiarity seriously affects the intelligibility of our document.

The author's anticipation of year 9 is, however, of great importance for it reveals a fact which, otherwise, might have remained unknown.

(1) A similar survey also appears in I 6, which is concerned with *χορτασί, τροφή* during the *rest of the month of the 8th year*.

(2) In Egypt the Indian year begins at a variable date, situated between the end of Pachon and the end of Tachet. Cf. L. Thompson: 'The Wages of *ἡμερολόγιον* and *χρονολογία* der Papyri', *ibid.*, I, 1, p. 15. In our document the last day of the 8th year seems to have been 30th Payni.

If the donkeys and foals that are dealt with in II 14 and the mules of II 18 have been fed on hay during Epeiph of the 9th year, there is no reason why this should not also have been the case during Epeiph of the 8th year. Except for four accounts (II 6, II 6, II 16 and II 19, 2-4) there is, however, no question of hay feeding during the initial months of the year (Epeiph-Hathyr). Although we would feel much more certain if II 6, II 16 and II 19, 2-4 were absent from sheet A-E, we would like to assume that sheet F-I, which has been preserved in a very poor state, was concerned with receipts (1) and expenditure (2) during the first part of the 8th year, whereas sheet A-E seems to have dealt, at least in principle, with transactions and consumption of the second part of the year (Chesk-Haym). The presence on sheet A-E, ~~therefore~~ ^{therefore} we shall call it sheet II of the above-mentioned accounts (2) apparently intends to repair omissions of sheet F-I (sheet I).

One would expect the author to separate on both sheets the accounts of receipts from the accounts of expenditure. This may have happened on sheet I, of which we know too little to assert the contrary, but it certainly has not been the case on sheet II. This sheet opens with a number of accounts of receipts belonging to the first class (cf. p. 10), and goes on with a similar account of the second class (II 5), followed by a related account of expenditure (II 6). Next come two further accounts of receipts of the second class (II 7 and 8), followed again by a related account of expenditure (II 9). Between II 9 and 10 a narrow account has been lost: it probably dealt with the provisions from which the expenditure, mentioned in II 10, was made. The next account (II 11) is again an account of receipts of the second class; its related document seems to have disappeared together with the rest of the 8th section. Next comes a total of 2167 *monna*, containing c. 1670 *monna* obtained from To Skeles, c. 120 *monna* from Kusis (3).

(1) Only two accounts of receipts, belonging to sheet F-I, are dated. Both concern the month usually of the year II 1 and II 2.

(2) The only account of expenditure of this class (II 6) covers a *zagrany* *tegrny* during the first months of the 8th year.

(3) They all concern the maintenance of *pony*.

49 *monia* from Tuli and 13 *monia* from Bausara (II 12). In our opinion these 2167 *monia* are the sum total of deliveries of the first class, recorded in the first, second and third sections of the sheet. On the verso of sheet II we first find a series of accounts of expenditure (II 13-20); the expenses, whose total amounts to 2082 1/2 *monia*, were covered by the above mentioned 2167 *monia*. The following accounts of expenditure (II 21 and 22) do not seem to have been preceded by any related accounts of receipts (1). In II 23 the author seems to have calculated the sum total of the expenses that were recorded on sheet II, whereas the last account of the verso (II 24) is an account of receipts which should normally have appeared on the verso of the 8th section.

(1) The expenses recorded in II 21 seem to have been covered by receipts mentioned in I 8, 10-11. Cf. our commentary on I 8.

CHAPTER II

THE PRIVATE ESTATE AT TO SKELOS

1. Extension and Connections of the Estate

The centre of activities and transactions described in our document was situated at *To Skeelos*, a village of the Arsinoite nome⁽¹⁾. This may safely be concluded from the headings of a few accounts⁽²⁾ and also from the fact that the main part of the 2167 *modia* of hay, mentioned in II 12, was derived from *To Skeelos*. Our document does not concern the entire village, but merely a domain situated within its territory. This may be deduced from II 1, 9 and II 2, 10, where the adjective *τοσκελιός* occurs.

The extension of the domain situated at *To Skeelos* seems to have been quite important. It must, first of all, have contained a large area of meadows, for its production of hay appears to have been very considerable. Although we ignore the total of local production of hay, some idea about its extent may be derived from II 12, 2, which refers to some 1670 *modia* obtained from the domain at *To Skeelos*. According to our calculations in n. 31, n. 2, 1670 *modia* must be equivalent to c. 66 800 kilogrammes. The number of *jooz* that were kept at the estate during the ploughing season may give us an idea of the area of arable land. Four troops of *jooz* are mentioned in our document. The first (18 animals) is dealt with in II 5 and 6 (consumption of hay during Thoth, Phaophi, and possibly also Hathyr) and probably also in II 11 (provisions for Pharmouthi-Payni). The second and third

(1) Cf. the list of Arsinoite villages in P. Tebt. II, p. 492.

(2) Cf. II 1, 1: *τοσκελιό Σκεδαίων ζήων*; II 5, 1: *τοσκελιό βοῶν Σκεδαίων*; II 11, 1: *λόγος χοιρίων τοσκελιό βοῶν Σκεδαίων*.

troop (respectively 6 and 17 animals) appear in **II 16** (consumption from 24th Phlophi until 30th Hathyr, and again from 5th Pharmouthi until 15th Payni); the fourth (11 animals) is dealt with in **II 19** (consumption from 20th Ibeth until 30th Hathyr, and from 1st Pharmouthi until 15th Payni). In order to avoid any overrating of the area of arable land of the domain of To Skelos, we shall assume that only the second and third troop were actually engaged in ploughing during the appropriate season (Phlophi-Hathyr). Their total number ought to be reduced from 23 to 20, for three of these animals died soon after 24th Phlophi (cf. **II 16**, 8 and **II 19**, 9-10). Although Columella, *De Re Rustica*, II, 12, 8, deals with Italic conditions, he may give us an idea of the work that has been effected by the oxen of *P. land*, 653: *semina quae quarto saluo seruntur in incertibus viginti quinqué desiderant babilcorum operas centum decem et quinq[ue] (1); non prescindi- tur is agri modus, quamvis durissim[us], quinquaginta apris, iteratur quinqué et viginti, tertatur et conseritur quadraginta*. Assuming that the two troops of *joz* carried out, in the course of 35 days of labour, a single ploughing, equivalent to Columella's *prescissio*, we obtain a total of 175 *ingera* = 100 *aroura* (2). The number of animals engaged in transport (e.g. a troop of 11 donkeys, two troops of mules, of respectively 14 and 20 animals) may strengthen our opinion about the importance of the domain at To Skelos.

To its proprietor the domain situated at To Skelos was much less important than it may seem to us, for it was only a small part of the possessions he owned in the Arsinoite nome. This may be derived from the following facts. During the initial months of the 8th year, and again at the beginning of the 9th, provisions of hay were obtained from various villages: Pansiris, Tan Melitonas, Hara³ 5, Teli, Monchos, Thaukos and Isak (uncertain reading). Although, during the second part of the 8th year, consumption of hay has mainly been

(1) 115 days' labour of the ploughmen; the context shows that Columella is thinking of a single sowing of oxen, cf. II, 12, 7: *quae et vides bestiarumque posse regum locumque habere centum viginti in uno cardaque agminum*.

(2) 1 *ingera* = 2325 m²; 1 *aroura* = 2750 m².

covered by local production, provisioning from outside continued to a certain extent, and some 129 *medoi* were obtained from Kusis, 49 from Tabi, 13 from Bousiris (1). Only a very small part of these provisions have been specified as being *χρίται ἀπομαρτίαι*; they are all recorded in 11. Unless we assume that, in spite of the absence of *χρίται ἀπομαρτίαι* from subsequent accounts, our entire document deals with provisions that had been bought, we ought to conclude from the restriction of *χρίται ἀπομαρτίαι* that, as a rule, provisions from other villages were not purchased, but received, which means that they were obtained from related domains. The affinity between the domain at To SkeLOS and the other villages had already been observed by Dr. Hummel (cf. *P. Lund.*, fasc. VIII, p. 355), who seems to have believed that the private estate of To SkeLOS possessed in the above-mentioned villages a series of dependent farms.

Bousiris, Monchis and Tabi belonged to that part of the Arsinoite nome which had previously been called the Division of Ptolemais (2). As for To SkeLOS, Tan Melitinos and Thanekeos, we only know that they were situated in the Arsinoite nome (3). Kusis is the name of a village in the Great Oxyris (provenance of *P. Grenfell* II 68-78) which can hardly be identical with the village of 11 12, 3; there may have been a second village of this name in the Arsinoite nome. Maer() and Kek (uncertain readings) are not mentioned in the geographical section of Preisner's *Wörterbuch*.

2. The Troops of Animals Kept by the Estate.

Thirteen different troops of animals are dealt with in our document. In twelve cases we know, either from the text or from the context, what kind of animals was concerned.

(1) Part of these provisions, namely those which would be fed to *plagi* during the initial months of the year, have been distributed during the first part of the year. An example is available in 11 1, 11, cf. our commentary ad l. p. 48.

(2) Cf. *P. Tebt.* II pp. 374, 389, 402.

(3) Cf. *P. Tebt.* II pp. 375, 389, 402.

ῥῥῥ; 14)

First troop:

accounts of receipts: **II 5**; **II 6**, 1-6; **II 11**.

accounts of consumption: **II 6**, 7-8; account lost in section 8,
verso.

18 animals (cf. count **II 6**).

Second troop:

accounts of receipts: **II 12** (general account); **II 24** (year 9).

accounts of consumption: **II 16**; lost account of section 8,
verso.

6 animals.

Third troop:

accounts of receipts and consumption: cf. 2nd troop.

17 animals.

Fourth troop:

II 19 refers to daily consumption of *4 qana* 20 *ankabai* (= 220 *ankabai*) from 20th Eloth until 12th Ploiophi; a consumption of *4 qana* 11 *ank.* (= 211 *ank.*) from 13th Ploiophi until 30th Hathyr, and again from 1st Phermothi until 15th Payni; a consumption of *4 qana* 9 *ank.* from 16th Payni until 30th Hathyr of the 10th year. The indication of the kind of animals concerned is lost. The amounts of daily consumption may be interpreted in two different ways:

- a. 220 *ank.* : 20 animals, receiving each a daily ration of 11 *ank.*
211 *ank.* : 20 animals; daily ration of c. 10 1/2 *ank.*
209 *ank.* : 19 animals; daily ration of 11 *ank.*
- b. 220 *ank.* : 11 animals; daily ration of 20 *ank.*
211 *ank.* : 11 animals; daily ration of c. 19 1/2 *ank.*
209 *ank.* : 11 animals; daily ration of 19 *ank.*

(1) It is, of course, preferable to refer to the *ankabai* from which, in our document, may refer to cows, as *ank.* as to oxen.

In the first case the daily rations per head would refer to a troop of asses (cf. *infra*), in the second to a troop of *paṛ*. We have adopted the second solution, mainly because the other cases in which sheet II is dealing with consumption of hay during the initial months of the year concern, without any exception, the keeping of *paṛ*.

Account of receipts: II 12 (general account).

Bulls:

First troop:

account of receipts: I 6.

accounts of consumption: I 6; II 21.

7 animals.

Second troop:

II 17 mentions a daily consumption of 3 *qumai* 25 *ankaba* by a certain troop of animals. This amount obviously refers to a troop of 7 animals, receiving a daily ration of 25 *ank.* per head. As II 21 deals with a team of 7 bulls, consuming 3 1/2 *qumai* a day, our account very probably concerns a second troop of bulls, containing again 7 animals.

Account of receipts: II 12 (general account).

Asses:

First troop:

accounts of receipts: II 7; II 8

account of consumption: II 9

11 + 4 animals.

Second troop:

account of receipts: II 12 (general account)

account of consumption: II 14

3 + 2 animals.

Mules :

First troop :

account of receipts : II 12 (general account)

account of consumption : II 18

14 + 6 animals.

Second troop :

II 10 deals with the keeping of a troop of animals receiving a daily ration per head of 21 *ank*, during the period 7th Pharmouth - 20th Pachon. From then onwards until 30th Payni the daily ration was reduced to 20 *ank*. As these are the same rations as those that are mentioned in II 18, the present account probably concerns another troop of mules. It contained 14 + 1 animals.

Account of receipts : lost account of section 6, recto.

Horses :

account of receipts : II 12 (general account)

account of consumption : II 14.

3 animals

Camels :

In II 13 we find the following situation : from 7th Pharmouthi until 20th Pachon a certain troop of animals consumed 1 *gan*, 10 *ank*, a day ; its consumption increased to 1 *gan*, 25 *ank*, from 20th Pachon onwards until 30th Payni. If the daily ration has remained the same throughout the entire period of *zogiazij neqij*, it must have amounted to 15 *ank*, and the troop in question must have consisted originally of 1, later of 5 animals. Daily rations of 15 *ank* have been given to the second troop of asses (cf. II 14). Instead of conjecturing the existence of a third troop of asses, we are rather inclined to believe that this account dealt with a troop of camels. It appears from I 2 that camels were kept at the domain of Io Skelos.

Account of receipts : II 12 (general account).

Uncertain case :

In II 22, 1 we are unable to read the information about consumption. It is therefore impossible to make any conjecture about the kind of animals concerned in this account.

The dates after which similar troops of animals were fed on hay do, as a rule, not entirely coincide. We shall give a few examples :

poet :

1st troop :

Thoth-Phaophi-Hathyr (?)
II 6

5th or 7th Pharm. - 30th Payni
lost account of sect. 8

2nd troop :

24th Phaophi - 30th Hathyr
II 16

5th Pharm. - 30th Payni,
II 16, 1

3rd troop :

26th Phaophi - 30th Hathyr
II 16

5th Pharm. - 30th Payni
II 16, 1

4th troop :

20th Toth - 30th Hathyr, II 19

1st Pharm. - 15th Payni, II 19

Bulls :

1st troop :

no clear information, I 6

1st Pharm. - 14th Payni, II 21

2nd troop :

no information

7th Pharm. - 30th Payni, II 17

Asses :

1st troop :

no information (1)

1st Pharm. - 30th Payni, II 9

(1) A few details may be derived from a study of the accounts of receipts. They will be mentioned on p. 21.

2nd troop :

no information

7th Pharm. - 30th Payni. II 14

Mules :

1st troop :

no information

1st Pharm. - 30th Payni. II 18

2nd troop :

no information

7th Pharm. - 30th Payni. II 10

It should also be noticed that the accounts of *goprakij roopij* during 5th of 7th Pharmouthi - 30th Payni have been grouped by the author of our document (II 10-17). The accounts referring to the period extending from 1st Pharmouthi until 10th, 15th or 30th Payni are the following: II 9, II 18-20 (in which the reckoning is continuous), II 21 and possibly also II 22.

The distinction of two or more troops of the same animals and the fact that they were fed on hay after slightly different dates could easily be explained if there were any indication that the animals were kept and working on different parts of the estate (2).

It has been noticeable already that the number of animals belonging to a certain troop did not remain invariable. Apart from the fact that the effectives of the 2nd and 3rd troop of *bee* were reduced from 27 to 20 animals owing to the death of three of them soon after 24th Pharmouthi (3), it should be noticed explicitly that some troops had their effectives increased during Pharmouthi-Payni. These are the data :

1st troop of asses :	14 animals until 30th Pharm.
II 9	18 animals from 1st Payni onwards.

(1) We have long thought that the details of II 12 did not concern the villages from which hay was obtained, but the place where it was delivered and consumed. It is, however, impossible to divide the troops that appear in II 13-20 into four groups whose consumption would have amounted to c. 1470, c. 420, c. 10 and c. 13 *manu*.

(2) They were not replaced.

2nd troop of asses :	3 animals until 26th Pachon,
II 14	5 animals from 27th Pachon onwards.
1st troop of mules :	14 animals until 30th Pharmouth,
II 18	20 animals from 1st Pharmouth onwards.
2nd troop of mules :	11 animals until 24th Pachon,
II 10	15 animals from 25th Pachon onwards.
troop of camels :	4 animals until 24th Pachon,
II 13	5 animals from 25th Pachon onwards.

The reason why these troops were strengthened is obvious. The period extending from the beginning of Pharmouth until the end of Epiphi was marked by great agricultural activities: harvesting (1), threshing, transport of agricultural products, work at the mill. Most of the above-mentioned animals were undoubtedly used for transport; some of the asses may have been used at the mill, or even on the threshing floor (2). In one case (1st troop of asses) the additional animals were bought (3); as a rule, however, they were probably borrowed from other domains, belonging to the same proprietor.

It seems likely that after the end of the main agricultural season some of the animals were disposed of. The accounts of expenditure, which are on the whole rather laconic about what happened after the end of Payni (end of the 8th year), do not give any information on this point. There is, however, an isolated note (II 3), relating the sale of animals. It has, unfortunately, not been dated.

(1) Cf. M. STASSON, *Die Landwirtschaft im hellenistischen Ägypten*, Munich, 1925, p. 164.

(2) Cf. M. STASSON, *l. c.*, p. 175.

(3) Cf. also II 3, 2.

CHAPTER III

ΧΟΡΤΙΚΗ ΤΡΟΦΗ

1. The Periods of χορτική τροφή

From the beginning of Pharmouthi until the end of Payni, all troops of animals that were kept at To Skeles appear to have been fed on hay. During the immediately preceding months (1st Eboiak - 30th Pharmouthi, i.e. 25th November - 26th March) there is, on the contrary, no question of χορτική τροφή. What happened during the initial months of the 8th year is not clear, because sheet 1, which probably dealt with the first part of the year, has been very badly preserved. The situation at the beginning of year 8 may be conjectured to a certain extent from a few accounts of expenditure belonging to sheet II, from details about deliveries which took place at the beginning of the 8th year, and also from the author's anticipation of the 9th year (cf. p. 11):

Initial months of the 8th year

βόες 1:

consumption on 7th Thoth, cf. II 6, 1.
deliveries: before 7th Thoth, cf. II 5; on 11th, 23rd, 25th Phaophi, cf. II 6.

βόες 2:

consumption: 24th Phaophi - 30th Hathyr, cf. II 16.
deliveries: 18th Epiph, cf. II 1, 11.

Anticipation of the 9th year

consumption during the beginning of year 9 was probably dealt with in the lost account of section 8, recto.

deliveries on account of the 9th year, cf. II 24 (no dates preserved)

Βόες 3:

consumption: 26th Phaophi -
30th Hathyr, cf. II 16,
deliveries: 18th Epeiph, cf. II 1,
11.

Βόες 4:

consumption: 29th Thoth - 30th
Hathyr, cf. II 19.
consumption: 16th Payni -
30th Hathyr, cf. II 19, 7,
deliveries in Payni, cf. II 20.

Βόες 1:

deliveries: 7th Epeiph - 20th
Thoth and 15th Payni - 17th
Phaophi, cf. I 6; cf. also
erased entries in II 1, 5 and
12.
consumption after 14th Payni,
cf. II 21, 11.

Βόες 2:

no information
probably: consumption after
30th Payni, cf. II 17.

Άσες 1:

deliveries: 15th and 25th Epeiph,
6th and 20th Mesore, cf. I 2,
cf. also erased entry in II 1, 6
(30th Mesore)
deliveries from 18th Epeiph until
at least 28th Phaophi, cf.
II 9.

Άσες 2:

no information
consumption during Epeiph, cf.
II 14, 5

Μules 1:

no information
consumption during Epeiph,
cf. II 18, 5

Mules 2 :

no information

consumption after 30th Payni,
cf. II 10, 5.

deliveries in Epeiph, cf. II
10, 6.

Foals :

no information

consumption during Epeiph, cf.
II 14, 5

Camels :

deliveries : 20th Epeiph, cf. I 2

probably : consumption after
30th Payni, cf. II 13, 3

Uncertain troop :

no information

deliveries from the beginning
(?) of Epeiph, until at least
10th Mesor, cf. II 22.

As opposed to the final months of the year (Pharmouthi-Payni), the extension of ζωοτεχνή τροφή during the initial months of the year (Epeiph-Hothyr) appears to have been different from one troop to another.

The situation seems to have been as follows. From 1st Chouk until 30th Pharmouthi (27th November - 26th March) all the animals of the estate were either pastured (this applies to the animals that were not engaged in agricultural work) or fed on green forage in their stables (this was the case with working animals). From the beginning of Pharmouthi onwards until the end of Hothyr (i.e. the end of March until the end of November) the pastures and the meadows of the estate were closed, which means that the animals of the domain were to be kept on dry forage. During the first three months of this period the entire live stock was kept on hay which, to a large extent, had been produced locally. From the end of Payni onwards local provisions became insufficient, and even the supplies that arrived from other villages (either from the market or from related domains) could not

cover the needs of a general *χαρτική τροφή*. During the period extending from 1st Epeiph until the end of Hathyr hay was consequently replaced to a large extent by other kinds of fodder. From Epeiph onwards its distribution seems to have been determined by: 1) the general trend of provisioning from outside, 2) the specific requisites of the animals that were to be fed, 3) the kind of work in which they were engaged. This explains why the picture is different from one troop to another.

The period during which the animals of the estate were pastured or kept on green forage (end of November until the end of March) is shorter than the grazing-period in modern Egypt, which, according to M. Schmechel (4), extends from December until June.

The fact that, during the period extending from 1st Epeiph until 30th Hathyr, *χαρτική τροφή* became very restricted in comparison with the previous months (Pharmouth-Payni), can hardly be explained as the result of a rational choice between various kinds of fodder. Difficulties connected in connection with the provisioning of hay are a well known topic of Greek papyrology, and a phenomenon of all times, cf. *PCZ* 30591 (middle of the 3rd century B.C.), *P. Mich. Zen.* 24 (237 B.C.), *PST* 336 (277/2 B.C.), *P. Oxy.* 1482 (2nd century A.D.), *PST* 285 (3rd or 4th century A.D.), *P. Oxy.* 3638 (late 3rd or 4th century A.D.).

2. The Daily Rations and their Weight.

P. land. 653 contains interesting details about daily rations of hay. These are the data:

II 16 2nd group of *φίεζ*:

21th Pharmuth - 30th Hathyr 20 *ank.* per head

3rd group of *φίεζ*:

26th Pharmuth - 30th Hathyr *idem*

(4) Cf. SCHMECHEL, *o. c.*, p. 145: «Das Vieh weidet von Dezember bis Juni und den Kleezeitraum.»

II 19 4th troop of βόες :		
20th Thoth - 12th Phaophi		20 ank. per head
14th Phaophi - 30th Hathyr		c. 19 $\frac{1}{2}$ ank. per head
1st Pharmouthi - 15th Payni		idem
16th Payni - 30th Hathyr		19 ank. per head
II 21 1st troop of bulls :		
1st Pharmouthi - 14th Payni		25 ank. per head
II 17 2nd troop of bulls :		
7th Pharmouthi - 30th Payni		idem
II 9 1st troop of asses :		
1st Pharmouthi - 20th Pachon		
13 animals		12 ank. per head
1st Payni - 30th Payni		
18 animals		12 ank. per head
II 14 2nd troop of asses :		
7th Pharmouthi - 20th Pachon		
3 animals		15 ank. per head
27th Pachon - 30th Payni		
5 animals		15 ank. per head
II 16 1st troop of mules		
1st Pharmouthi - 30th Payni		
14 animals		24 ank. per head
additional 6 animals		20 ank. per head
II 10 2nd troop of mules		
7th Pharmouthi - 20th Pachon		
14 animals		24 ank. per head
25th Pachon - 30th Payni		
15 animals		20 ank. per head
II 14 troop of foals		
5th Pharmouthi - 30th Payni		25 ank. per head
II 13 troop of camels		
7th Pharmouthi - 24th Pachon		
4 animals		15 ank. per head

25th Pachon - 30th Payni

5 animals

15 *ank.* per head

A few points will have to be noticed. The reinforcement of a troop appears to have led, at least in some cases, to a reduction of rations. This is the case with both troops of mules: in II 18 the newcomers received 20 instead of 21 bundles; in II 10 the arrival of an additional mule led to a general reduction of rations (20 bundles instead of 21 before). The reason why the daily rations of the 4th troop of *phrc* were reduced after 12th Pharmoth cannot be guessed; a similar reduction (after 15th Payni) is easier to explain. From 1st Pharmoth until the end of Payni the animals kept by the estate were mainly fed on local provisions (cf. p. 25), whereas, from Epiphi onwards, their stallmen had to rely mainly on deliveries from related domains. The reason why, from 16th Payni until 30th Hathyr, the rations of the 4th troop of *phrc* were reduced, was probably the same as that which, at the end of year 7 and the beginning of year 8, led to the purchase of hay, namely the gradual exhaustion of local provisions, the slow start of provisioning from related domains and its insufficiency. A last point to be mentioned concerns the feeding of the asses: the first troop (*phrc* *phrc* *phrc* *phrc*) received a daily ration of 12 bundles per head, the second (*phrc* *phrc* *phrc* *phrc*) 15 bundles per head. The difference could probably be explained if we knew what kind of work was done by these animals.

How much did an *aspidochelone* weigh? According to II 20, 9 and 12 the bearing-power of an ass was 1 *tan* = 200 *ankala*. This explains why the amount of must deliveries of hay constitutes a multiple of four. The *ganai* of our document seems to have been equivalent to the *ganai* of earlier times, for according to *Hist.* 1502 (end of the 3rd century B.C.) a certain number of asses, engaged in the transport of hay, carried 4 *phorti* each (4). As a *phortion* of hay contained 20 *diaphori* *diaphori* (5),

(4) *Hist.* 1502 (p. 1502) mentions the transport of 16 *phorti* to three (the *stath* of *Phari* *stath*). Two of these *stathi* probably took a single expedition, whereas their companion made a double journey.

(5) Cf. P. Colla Zaccaria, vol. III, p. 113.

we ought to be able to calculate its weight. The adjective *δυνατός* (2) may refer to the so-called *πυθαγόρειος μῶδ*, which, according to ancient metrological authors, was equivalent to 1 1/2 Roman pounds (3). A *δέξαρις* *δυνατός* would consequently have weighed 3 Roman pounds = 4882 grammes, and a *πίστια* or *γάνος* (at least the *γάνος* of our document) 20 = 9882 grammes = c. 20 kilogrammes. The bearing-power of an ass would have amounted to c. 80 kg. of hay. If our calculation is exact, the *αὐλάδα* of our document must have weighed c. 400 grammes (4), at least in theory, for it is clear that bundles of hay (even when they were called *δυνατός*) were never weighed on scales.

The elements of our calculation are supported by the following facts. 1) Columella, *De Re Rustica*, XI.2, 40 speaks of bundles of hay, weighing 4 pounds apiece: *per hoc dies rursusque castris und, faciens ut institueretur. Item operarius prati ingenui decem, per menses mille ducentas manipulos annis attolant, qui aut viginti quatuorcentum librarum.* 2) According to C. Wilcken (4) and M. Schmidt (5), an ass could carry 3 portulacs of wheat: as the 40 *χάρυκες* attolent (i. e. the most usual) contained c. 40 litres, and a litre of wheat has a weight of c. 670 grammes, this means again a bearing-power of c. 80 kg.

Arcont II 2, 6, 8 and 11 seems to refer to deliveries consisting of *γάνος* which contained 20 *αὐλάδες* each. The first delivery amounted to 66 *γάνος*, the second and third to 67 *γάνος*. As there is no conversion of these loads into the usual 40 *αὐλάδες* common, we must assume that their weight was the same as that of the latter. This means that the bundles they contained must have weighed 2 1/2 times as much as the

(1) The term *τοποθετικὸν μέτρον* (*topothetikon metron*) is used only in our document, cf. *Πρὸς τὸν ἀρχιεπίσκοπον καὶ τὸν ἐπίσκοπον τῆς ἑκκλησίας τοῦ ἁγίου Πνεύματος* (1751) 409 (same person), cf. *Πρὸς τὸν ἀρχιεπίσκοπον καὶ τὸν ἐπίσκοπον τῆς ἑκκλησίας τοῦ ἁγίου Πνεύματος* (1751) 463 (56 & 130).

(2) Cf. C. Hermann, *Die griechische Metrik*, 2. Aufl., Göttingen 1897, *Suppl.* 19, 1. Aufl. 1891, 2. Aufl. 1892 (1893) p. 35.

(3) A *πύλος* contained 500 *λίτρα*.

(4) C. Wilcken, *Urkunden und Pachtverträge aus Ägypten*, Leipzig 1899, vol. I, p. 754.

(5) M. Schmidt, *ibid.*, p. 338.

usual *ankalai*. The *δέσμαι διμναῖοι* of Ptolemaic and Roman times have lost their name, but they seem to have survived.

We may conclude from this that the term *ἀνθάλη* merely meant 'bundles' and had not become a metrological term⁽¹⁾. The same is true of the terms *δέσμη*, *δέμα*, *ἀνθήμα*. Similarly the term *γόμενος* merely signified a beast's load. To the stablesmen of To Skolos the term *ἀνθάλη* undoubtedly meant a bundle of a definite weight (the lighter one) and the donkey-drivers of the estate and its related domains surely had no divergent ideas about the weight of a *gomos* of hay. But it is likely that the metrological implication of these terms was only understood in a relatively small circle.

The term *μάρσιον* on the contrary seems to refer to a well established measure of capacity⁽²⁾. If *marion* had kept its original meaning of 'receptacle, box'⁽³⁾, there would have been no reason to convert a total of *gamai* into a total of *maria*, for the generally accepted meaning of the latter term would have been just as vague as that of the former.

We shall now convert the rations, recorded in our document, into kilogrammes. The *ἀνθάλαι* will be reckoned at 100 grammes, cf. *supra*.

2nd and 3rd team of βόες	20 <i>ankalai</i> per head	= 8	kg
4th team of βόες	20 <i>ankalai</i>	= 8	kg
	19.15 <i>ankalai</i>	= 7.78	kg
	19 <i>ankalai</i>	= 7.6	kg
1st team of asses	12 <i>ankalai</i>	= 4.8	kg
2nd team of asses	15 <i>ankalai</i>	= 6	kg
both troops of mules	21 <i>ankalai</i>	= 9.6	kg
	20 <i>ankalai</i>	= 8	kg

(1) In *P. Oxy.* 1919 (late 2nd cent. A. D.) a *μάρσιον* contains 43 *ἐξάγκυλα*; in *SB* 1959 (3rd cent. A. D.) it is reckoned at 30 *ἀνθάλαι*.

(2) This word, of Egyptian origin, is also spelled *μάρσιον*. In connection with deliveries of hay the term appears in the following documents: *O. Tait Hadl.* 1, 2306-241, 2533 and 342 (2nd cent. B.C.), *O. Tait Hadl.* 1, p. 64 = *SB* 3568 (2nd cent. B.C.), *P. Oxy.* 1734 (2nd-3rd cent. A.D.), *PSI* 508 (3rd century A.D.), *P. Rendet Harris* 159 (5th-6th cent.), *P. Oxy.* 146 (555), *P. Oxy.* 2646 (6th cent.).

(3) Cf. *P. Hab.* 19 (255 B.C.), *P. Petrie* 111.65a (19th c.).

both troops of bulls	25 <i>ankalai</i>	= 10 kg
troop of bulls	25 <i>ankalai</i>	= 10 kg
troop of camels	15 <i>ankala</i>	= 6 kg

It may be worthwhile to convert into kilograms the totals of expenditure that are recorded in our document. Account I 4 reaches a total of over 10,000 *gama*, i.e., c. 200,000 kg (1). Unfortunately enough, this item is difficult to interpret, not only because its connection is very obscure (the account belongs to sheet I, of which we know very little), but also because it has been erased by the author. The total of expenditure recorded in II 13 19 amounts to 2082 *manin* 83,280 kg (2). It contains 110 *qatun* = 550 *qatun* = 27,500 kg spent in trade operations (barter), and 1542 *manin* = 60,780 kg consumed by various troops of animals, mainly during Pharamouth-Paym of the 8th year.

3. The Components of the Animals' Diet.

The *yigraq* which is the subject of our document very probably came from artificial meadows, and must consequently have been composed of cultivated plants (mainly clover) and, to a smaller extent, of graminaceous plants (3). The term *yigraq* was applied to green forage as well as to dry forage; in our document it certainly referred to the latter. During part of the year at bank-Phamwoth the animals, kept at To Skales, have undoubtedly been fed on grass, either on pasture land, or in their stables. If there has been any acquaintance about stall-feeding on grass, it must have been separated from the document we possess.

Cato, *De Agri Cultura*, 54.3 gave the following advice in connection with the feeding of oxen: *interdum pascat, noctu feni pondus XXV uni*

(1) The *gama* has been reckoned at 20 kg, cf. supra p. 29.

(2) 1 *manin* was equivalent to 2 *gama* (cf. p. 23 34, 10). The contents of a *manin* measure of capacity of hay must correspondingly have weighed 40 kg.

(3) The subject is dealt with by M. SAKURAI, *op. cit.*, pp. 211-218.

barj dala. As far as we know, a combination of pasturing (or stall-feeding on grass) and hay feeding would only have been possible at To Skeles during Chank-Parmouth, when greenings and meadows were open (cf. p. 25). During these months, however, not a single ration of hay has been issued to whatever troop of animals.

During the initial months of the year (Ipeiph-Hathya) some of the troops have undoubtedly been fed (at least for part of the time) on products which were neither grass nor hay. The question arises whether these products were also provided for animals that were fed on hay i.e. whether they supplemented *χαιτηξί, τροφή*. The answer to this question might probably be positive. A first indication may be found in §§ 15, which concerns the exchange of 600 *gama* of hay against a certain quantity of chaff. As this exchange has very probably taken place during Pharmouth-Paym, the product in question may have served as a supplement to the hay rations that were issued in the course of that same period. A second indication will be derived from a comparison of our data with rations that are mentioned in other documents (1).

We shall limit our comparison to a small number of documents which are unlikely to have part of the animal's diet unmentioned and are referring to metrical units whose weight or capacity are known (2).

(1) There exist two doctorate dissertations on ancient cattle-feeding: E. Viscari, *Die Heubereitung in der Antike* (Gießen, 1931) and by Z. Kossio, *Die Heubereitung im alten Griechenland* (Lissabon, 1932). Their chapters on *Fütterung* have surely taught us that no ancient literary information on this subject seems to have escaped our attention.

(2) A sample of the material (p. 277) is found in the late third century B. C. E. recording fully how a certain number of animals (2, 3, 4, 5, 6, 7, 8, 9, 10) per head for a troop of *αἰγες* (524) were fed (cf. p. 278) in the course of the feeding of horses in the course of a journey. The first conclusion is therefore likely to be fallacious and records their daily consumption of food (calculated, both of the number of animals concerned: 524, 520 and 520) and of the quantity of food (calculated for the daily ration per head) amounting to 1000 *medimna* of hay, supplemented by wheat and barley. The weight of the *medimna* in question is unknown (probably not identical with that of the *denario-dramma*). I. Petrie 11, 25 and 256-61, C. concern the feeding of horses; their daily ration of hay amounted to 2 *denario-shimma*. As these Petrie

P. Petrie 111 61 g and b (226 B.C.) both concern the same case, namely the keeping of 15 horses and 10 mules during a short period. Each of the horses was fed on 8 *desmai dimnioi* = 8 kg (4) of hay and 1/3 *artaba* = c. 5 kg of barley a day, each of the mules on 8 *desmai dimnioi* = 8 kg of hay, and 5 *choinikes* = c. 3 kg of barley a day.

On two occasions (*De Re Rustica*, VI. 3 and XI. 2) Columella explains to the Italian farmer that the diet of oxen ought to be regulated according to the time of the year. We shall limit our quotations to the passages in which there is question of *farinam*. Except for one case (XI. 2. 99) the hay rations he indicates were not to be supplemented by other products.

January

VI. 3. 5: *si grana abstinentius, frondis aridae cortus pabulatorum modiorum viginti, vel fœci pondus triginta, vel sine modo vitulis linteæ et illyria frondis.*

XI. 2. 99: *menſe Ianuario paleas cum etiam macerati velatus sex, vel paleas cum coactibus prete xenodio, vel frondis cortem pabulatorum modiorum viginti, vel paleas quantum velint, et fœci pondus viginti, vel affatum vitalem prondem ex alice vel linteæ, vel, quod his omnibus preestat, faraginum hordeaceam dabit necam.*

February

VI. 3. 6: *menſe Februario plerumque eadem sunt cibaria.*

XI. 2. 99: *Februario menſe idem.*

papyri belong to the same archive as P. Petrie 111 61 g and h, in which the same ration of hay is supplemented by a ration of barley (cf. above), they probably leave part of the horses' rations unmentioned.

(1) As we have reckoned, in our previous conversations, the ankale at 401 grammes, the *desmai dimnioi*, which weighed 2 1/2 times as much, has to be reckoned at 1 kg. Its theoretical weight was 902 gr., cf. p. 29.

March and first half of April

- VI. 3. 6 *Martio et Aprili debet ad fœni pondus adiri, quia terra proscinditur; sal autem erit pœnis quod de arborum singulis daret.*
 XI. 2. 99 *Martio oleas, vel, si opus fuerit vinet, fœni pondus quinquaginta. Aprili frondem quercuum et populænam ex col. ulidis vel palens vel fœni pondus quadraginta.*

November and December

- VI. 3. 8 *Novembri mense de Decembri per sementem quantum appetit boves, tantum praecedendum est plerumque lumen sufficienti singulis modis plantis et palens ad satisfactionem daret, vel lupini macerati modis, vel etiam aqua conspersi secundum VII permixti palens, vel singulis modis vitaverunt, si ita, ut supra dixi, large palens adiceretur; vel si nihil horum est, per se fœni pondus quadraginta.*
 XI. 2. 101 This passage does not take into account the possibility of feeding on hay.

According to Columella's calendar no hay would have to be fed from the middle of April onwards until the end of October. During these months oxen were to be kept on green forage (until the middle of June, or even until 1st July in cooler regions) and afterwards (up to 1st November) on leaves, matured by sun or by continual dew (cf. VI. 3. 6-7).

Finally two data, derived from Cato's *De Agri Cultura*, ought to be mentioned. They are again dealing with the keeping of oxen: 54. 1: *interdum pascito, noctu fœni pondus XXV (= 8.38 kg) mi hœi dato*; 54.3: *ubi verno dare coeperis, modum (= 8.75 litres) glandis aut pinæcorum dato aut modum lupini macerati et fœni P, XV (= 4.91 kg).*

According to our calculations on p. 20, the *plœs* kept at the estate received a daily ration of c. 8 kg of hay. As Columella's calendar recommends rations of hay which varied, as far as they were not to be supplemented by other products, between 9.82 and 16.37 kg, it seems

likely that the rations, recorded by *P. Land*, 673, have been supplemented by other products. These supplements must have been less nutritive than *Columella's - paleae quantum est huius* (N. 1.2.98) or *Ualer's - modicum glandes aut vinaceorum aut modicum lupini nouerati* (54.3) for the former were to supplement a hay ration of only 6.54 kg the latter a hay ration of 4.91 kg. They must have made up for the absence of pasturing, for according to *Isid.*, 54.1 a *pauis* by day would have to be supplemented by a hay ration of 8.38 kgr, almost exactly the ration of 6.62 in *P. Land*, 673) in the evening.

One of the supplements that were given to the donkeys of the domain seems to have been the chaff, whose acquisition is mentioned in 11 15. *P. Orig.* 1734 (late 2nd or 3rd century A.D.) II 15 deals with oxen, fowls (the reading is uncertain) and calves *οὐ καὶ ἐπιβόας χορτάσαι, τὰς μικροὰς ἀγορεῖ ἐπὶ τῇ ἀλῆα* (Schubert, loc. cit. p. 218: «*Den durch Treten gepresst* »).

As for the diet of mules, kept at Fo Skelos, although their hay rations were on the whole more substantial (11.6 kg) than those that are mentioned in the *Petrie Papyri* (8 kg), it seems rather unlikely that their feeding consisted of nothing but hay. The difference between 9.6 and 8 kg of hay does not make up for the 3 kg of barley that were given as part of their daily diet to the mules whose feeding is recorded in *P. Petrie* III 61 g and h. If the *ζῳογ.* records of the estate at Fo Skelos were preserved, we probably would hear more about the τροφή of mules.

The rations of hay, issued by the estate to the donkey-drivers and the camel-drivers, cannot be compared with data from other documents. They are less likely to have been supplemented with other products, for asses and camels were easy to keep.

The problem we are dealing with in this chapter may be further illustrated by calculating the nutritive value of the rations which are mentioned in our document and comparing our results with the specific needs of the animals concerned. The following calculations are based on data which we owe to the kindness of Professor A. De-vogst, Director of the Zootechnical Institute of the University of Louvain.

To find out whether the hay rations of our document were covering, on their own, the animals' needs, we ought to know three elements: 1. the exact composition of the hay which has been fed; 2. the intensity of the work done by the animals; 3. the animals' live weight. Being of mediocre quality, Egyptian hay may have contained, according to Prof. Devoust, c. 15 gr of protein and c. 310 gr of starch-value per kilogramme. As for the second question, we believe that the animals of the Aramite estate were employed rather intensively; some of them may even have performed heavy work. The third question is difficult to answer, because we ignore to what breed the animals of our document belonged and we know very little about their age⁽¹⁾.

Bulls, oxen and cows require the following daily amounts of protein and starch-value per 100 kg of live weight:

1. for mere maintenance	60 gr of digestible protein	680 gr of starch-value
2. for light work	100-110 gr	740-750 gr
3. for medium work	110 gr	960 gr

As the oxen of our document received, in general, 20 *ankala* = 8 kg of hay a day, their ration contained 800 gr of protein and 2180 gr of starch-value. In the third category of work these amounts would have covered the needs of an ox weighing some 250 kg. Whatever may have been the variety to which the oxen of the estate belonged, they certainly weighed more than 250 kg. The hay rations given to oxen must consequently have been supplemented with other products.

The bulls of the estate were fed on 25 *ankala* = 10 kg of hay a day, which means that they received some 400 gr of protein and some 3100 gr of starch-value. This would have been sufficient to secure, in the third category of work, the fitness of an animal of some 320 kg. The bulls in question must have been considerably heavier, and they

(1) It is not certain at all that the terms *poenibacc* (II 10,9) and *paridiator* (II 2,7; II 18) have kept their diminutive meaning. The *lanáza* of II 1,4, and II 2, 11, however, are likely to be identical with the *πολάγια* of II 14,3.

consequently must have received supplementary rations of other products.

The daily amounts of protein and starch-value required by horses, mules and asses are the following (again per 100 kg of live weight):

1. for mere maintenance	60 gr of digestible protein	500 gr of starch-value
2. for light work	80 gr	700-740 gr
3. for medium work	100-105 gr	900-1000 gr

The foals of the estate, fed on 25 *ankahai* = 10 kg of hay a day, received 450 gr of protein and 3400 gr of starch-value. The amount of starch-value would have been sufficient to secure, in the third category of work, the efficiency of a 320 kg animal. As opposed to the previous cases, it is not unlikely at all that a foal should have weighed 320 kg; in this case we consequently are not forced to assume that the animals' hay rations have been supplemented with other products.

The mules of our document would probably have been insufficiently fed if they had only received 24 or 20 *ankahai* = 9.6 or 8 kg of hay. The higher ration contained 432 gr of protein and 2976 gr of starch-value. The latter amount would have covered the needs (in the third category of labour) of an animal weighing some 300 kg, which is a rather low weight.

As for the asses of the estate, even those that were fed on 12 *ankahai* = 4.8 kg a day (others received 15 *ankahai* = 6 kg.) did not need any supplementary products. 4.8 kg of hay contained some 216 gr of protein and some 1488 gr of starch-value. The amount of starch-value would have been sufficient to keep a 150 kg ass fit for work of the third category; this is a likely body-weight for an animal whose carrying power amounted, according to our document, to ca. 50 kg (cf. p. 29). The animals that were fed on 6 kg a day were probably employed in heavy work.

The information we obtained from Prof. Dexuyt consequently confirms the conclusions we drew after comparing our document with details derived from other Greek papyri and from Latin authors.

CHAPTER IV

THE ACCOUNTANCY

The author's information seems to have been derived from accounts that were delivered to him by various people, employed at the domain of To Skeles, or belonging to the staff of related domains (†).

Owing to the almost complete loss of sheet I and to the very fragmentary state of sheet II, the general thread of the author's accountancy is far from easy to follow. The situation is further complicated not only by the author's anticipation of year II (cf. p. 11) but also by the presence on sheet II of a number of accounts which are not at their normal place. This is obviously the case with **II 24**, which should have appeared in section 8, verso; in our opinion it also applies to **II 5** and **6**, **II 16** and **II 19**, 2-4, which are all concerned with the maintenance of *plous* during the initial months of the XIIth year, and ought normally to have been listed among the accounts of sheet I. In all these cases the author seems to repeat earlier omissions.

Although our author seems to have proceeded too rashly to avoid omissions and mistakes, he can hardly be accused of negligence, for most of his errors have been repaired. Apart from the examples quoted above, we might refer to **I 4**, **II 1**, 5, 6, 12, **II 6**, 2, **II 13**, 1, **II 16**, 1, **II 18**, 6 (correction of mistakes), **II 9**, 3 and **II 10**, 7 (retrieval of omissions), **II 14**, 1 (doubtly retrieval of an omission, afterwards corrected). There are only two mistakes that have been overlooked by our author: in **II 16** there ought not to be question of 23rd and 25th Phaophi, but of 21th and 29th Phaophi.

† Cf. **I 2**: *λόγος Ημερολογίου*; **II 2**: *λόγος χρόνου Φεβητος*; **II 7**: *λόγος Ίδμεων αναδίκων*; **II 8**: *λόγος χρόνου Ημερολογίου*.

The author's carefulness is also proved by the following facts. He seldom simplifies the sums he obtains after having multiplied an amount of daily consumption with a number of days. This has only been the case in II 13, 2 (57 *gomo*i instead of 57 *goma* 30 *ankalan*) and in II 16, 7 (946 *gomo*i instead of 946 *goma* 30 *ankalan*). In some cases the accounts he consulted do not seem to have contained all the details he needed. He then leaves the necessary space for a later addition. This has been the case in II 18, 7, where the addition took place (1), and in II 22, 3, where it did not.

The author's accountancy might be called a peculiar mixture of different intentions: in some respects he merely wants to give a *statement*, whilst, in other cases, he intends either to *explain* or to *check*. — As a whole his *λογος χοιρας* is a mere statement, for it does apparently not intend to explain a general surplus or a general deficit of *χοιρας* by comparing the total of receipts with the total of expenditure. — The same is true of the entries of II 1, II 2, II 11, II 15, II 11, for none of these accounts of receipts of the 8th year ends with a total of deliveries whose composition would have been explained by the body of the account; there is, however, no question of uniformity, since II 2 indicates at the end a sum total of provisions delivered by Philh (2). As opposed to the accountancy of receipts of the 8th year, the lists of receipts of the 9th year usually end with a total, cf. II 10, 7, II 13, 1, II 14, 6, II 17, 2, II 18, 5, II 20, 22, and probably also II 9 and II 22, 8. — In II 20, 9 and 12, the reference to the number of *ζῳα* by whom the transport had been effected has an explanatory function: as most of the provisions have been conveyed by donkeys, one does not see why these details should be given here, and not elsewhere. — In the accounts of consumption the author's reference to the number of animals, the daily ration per head and the number of days during which the animals were fed on hay, clearly intends to explain the total of consumption during the period concerned. On

(1) The writing of l. 7 is more sloping than that of the preceding lines, and the ink is different, cf. Plate IV.

(2) II 7 gives a partial total in l. 4.

the contrary, as far as the anticipation of the 9th year (cf. p. 11) is concerned, these same accounts give too little explanation. Here we ought to know at least the total of consumption, the total of deliveries, and the difference between both sums. In actual fact the author does not indicate the total of consumption (cf. II 10, 5-7, II 14, 5-7, III 18, 4-5) except in one case, where it is at least calculable (II 19, 7); in II 13, 4, II 17, 2, II 21, 14-7 and II 22, 2-8, he neither indicates the total of consumption nor the difference between this total and the total of deliveries. Some of the accounts of consumption give a total of receipts of the 8th year (cf. II 10, 2, II 14, 5, II 21, 10). If these references were more frequent, one would be entitled to believe that the details of the accounts of receipts have been given in order to check the correctness of the former. Although there has indeed been some checking (cf. I 2), it does not seem to have influenced the general structure of the account.

We may safely conclude from all this that the author of our document started upon his work without a clearly defined design. Together with the omissions of which we spoke at the beginning of this chapter, and with the change of procedure, dealt with on pp. 52-3, the author's confused intentions show that he has been overwhelmed by the imposing number of *zitiōn* he had to take into account⁽¹⁾.

(1) This number must have been considerably higher than the number of *zitiōn* contained in our document. Most of these *zitiōn* resulted from a combination of two or more *zitiōn*.

CHAPTER V

FIRST SHEET (FRAGMENTS F+D)

RECTO

- 11** 1 [τὸ] ἄρτιον ἔσται ἡμεῖς ἡμεῖς . .
 [ἡμεῖς] ἡμεῖς ἡμεῖς ἡμεῖς ἡμεῖς ἡμεῖς
 1 . . καὶ ἡμεῖς ἡμεῖς ἡμεῖς
 1 [τὸ] ἄρτιον ἡμεῖς ἡμεῖς ἡμεῖς
 5 ἡμεῖς ἡμεῖς ἡμεῖς
 1 [τὸ] ἄρτιον ἡμεῖς ἡμεῖς ἡμεῖς
 [ἡμεῖς] ἡμεῖς ἡμεῖς ἡμεῖς ἡμεῖς
 γόμον 2 (καὶ ἡμεῖς) γόμον . .
 (καὶ) ἡμεῖς γόμον (καὶ) γόμον ἡμεῖς
 10 γόμον ἡμεῖς.
 ἡμεῖς ἡμεῖς ἡμεῖς
 [ἡμεῖς] ἡμεῖς ἡμεῖς ἡμεῖς ἡμεῖς

I 2, 3: 6th Mesore	II 9, 11: 6th Mesore,	delivery from Housiris
I 2, 4: 25th Epeiph	II 9, 9: 25th Epeiph,	idem.
I 2, 8: 29th Mesore	II 9, 15: 29th Mesore,	idem.

These concordances are purely fortuitous, for I 2, 6 has no counterpart in II 9, and the deliveries from Housiris, recorded in II 9, 8 (11th Epeiph), 10 (1st Mesore), 13 (21st Mesore) are not referred to in I 2. The account II 9, 6-23 deals with deliveries of the 8th year, whereas I 2 records deliveries which took place at the beginning of the 8th year.

Two entries (H. 2 and 9) do not tell us for what reason the *gonoi* in question had been delivered. These provisions would probably be exchanged against other agricultural products, cf. similar entries in II 2 and cf. also II 15. The motivation of the delivery recorded in I. 1 is not clear. The term usually refers to a fee paid to scribes or to a tax.

Fragment 11; its position is uncertain, 3,8 x 3,8 cm.

I 3 ἀπὸ Μαρτ() x
 ἀπὸ Μαρτ() ι
 ἀπὸ Μαρτ() ι

The amounts mentioned refer to ; *med.* The amount is only complete on its right side.

Μαρτ() is likely to have been the name of a village, rather than of a person. The deliveries recorded in this column probably took place at the beginning of year 8.

Fragment 1; belongs to the bottom of the sheet; 6,5 x 7,5 cm.

I 4]
 [... ἐξ ἀποζωπάρ(ον)
 [ῥήπτα] α.β.γ.δ.ε.
 [..... γ(όμ.) — — — —]

The beginning is missing. The entire account has been erased by its author.

I 4 has been dealt with on p. 31.

VERSO

Fragment I

15 Only the end of two lines has been preserved:

μῦμ
]. α

Fragment II

The verso contains no traces of writing.

Fragment G

- 16** 1 [τῶν(ῆ) . . . | γ() τὰ(ῶ) τῶν() ἀπὸ Φαργαδ(ῶ)ν
[ἀπὸ Ἐπ(ῶ)]; 2 Διὸς θεο(ῶ)ν |
[. . . | τῶν() ἀπὸ | Ἡδ(ῶ)ν α Διὸς Φ(ῶ)ν(ῶ)ν() εἰ
[. . . | α |
3 [. | . . .
ἀπὸ |
ἀπὸ Μολύ(ῶ)ν() γ(ῶ)ν() α ἀπὸ τῶν() Σολ(ῶ)ν() α
ἀπὸ Τελ(ῶ)ν() Φα(ῶ)ν(ῶ)ν() εἰ γ(ῶ)ν(ῶ)ν() . [
ἀ(ῶ)ν(ῶ)ν() εἰ γ(ῶ)ν(ῶ)ν() α |
10 ἰξ(ῶ) | . . .
ἀπὸ | . . .
ἀπὸ Τελ(ῶ)ν() | . . .
[. | . . .

The account has been very badly preserved. Its right half and its end are missing. From 1. 6 onwards we possess the beginning of the lines; the initial letters of 1. 1, which seems to have been pointing to the left, have not been preserved. 1. 1, γ() τὰ(ῶ)ν(), for the first letter that has been preserved is clearly a γ; τὰ(ῶ)ν() seems to have been preceded by the abbreviation of a term which was used to specify the troop in question; there were indeed three *spei* units. 2. τῶν() α ἀπὸ τῶν() Σολ(ῶ)ν() α, Φα(ῶ)ν(ῶ)ν() εἰ has been restored in accordance with 1. 6; the abbreviation ἰξ(ῶ) will appear again in II 2. 17, II 6. 6, II 12. 2; it is always used in connection with *proedra*.

I 6 very probably concerns the first troop of bulls, whose maintenance during Pharmouthi-Payni of the 8th year will be dealt with on the second sheet, **II 21**. The course of **I 6** seems to be as follows: remaining provisions after Pharmouthi-Payni of the 7th year — deliveries on account of the initial months of the 8th year, consisting of a. provisions obtained from a single village between 7th Epephi and 20th Phothi, b. provisions obtained from various villages between 15th Payni (7th year) and 15th Pithouphi — total of expenses during the initial months of year 8 (lost in l. 8) — surplus — deliveries of hay which would be consumed during Pharmouthi-Payni of the 8th year.

The last item of **I 6** is important, for its presence in **I 6** probably explains why **II 21**, as opposed to the other accounts of sheet II, is not preceded by any related account of receipts. **II 21**, 840: *Exoroti de enag rige aketis*; very probably summarizes the receipts that had been listed in **I 6**, 10-13 and the following lines, which are lost.

Although we know very little about the accountancy on sheet I, the formulation of **I 6** is likely to have been rather exceptional. 1. As a rule, the accounts of expenditure of sheet I cannot have recorded the provisions received for the maintenance of animals during the initial months of the year, for otherwise **I 1**, **I 2** and similar accounts would have been useless. 2. The accounts of expenditure of sheet I did not usually contain a survey of provisions that had been received on account of *xyptoteri rpoetis* during the final months of the year; the delivery of provisions that would be consumed during Pharmouthi-Payni would normally be recorded on sheet II, in connection with the accounts of expenditure during that same period.

It ought to be noticed that the provisioning for the initial months of the 8th year started on 15th Payni of the 7th year (cf. l. 3). Similarly the deliveries on account of year 9 seem to have taken place from 15th Payni of the 8th year onwards, cf. **II 21**, 14.

Fragment F

Faint traces of writing.

SECOND SHEET (FRAGMENTS A-E)

RECTO

SECTION 1

Fragment E; constitutes the upper half of the section : 9,3 x 14,6 cm.
(II, Plate I (2)).

II 1 1 † *Herionis Marionōi*

	Φαμενὸς τρωγ(ε) (ὑπο)ζ(υγίον) ζ(ήσον) ἡμ(ετέριον)	
	(καὶ) δι(α) τῶν ἀρχαυτ(ῶν)	γ(όμ.) [—]
	τρωγ(ε) ὑποζ(υγίον)	γ(όμ.) [—]
5	Ἐπιγ x ταύριον (ὑπέρ) Μερῶ	γ(όμ.) λ [.]
	Μερῶ λ τρωγ(ε) ἀρχαυτ(ῶν)	[γ(όμ.) —]
	Χοίαν τρωγ(ε) (ὑπο)ζ(υγίον) ζ(ήσον) ἡμ(ετέριον)	
	τρωγ(ε) (ὑπο)ζ(υγίον) ζ(ήσον) ἡμ(ετέριον)	[γ(όμ.) —]
	Μήνις	[γ(όμ.) —]
10	(καὶ) ἐπιγ x τῶ λ γ(όμ.)	
	Ἐπιγ γ Ταύριον . . . [γ(όμ.) —]
	x τρωγ(ε) ταύριον (ὑπέρ) Μερῶ	γ(όμ.) []
	(καὶ) . . . (αὐτῶν) . . . () Ταύριον	λ
	Μερῶ	ε
15	(καὶ) (ὑπέρ) Ταύριον	κ
	(καὶ) α ἡμ(ετέριον)	... [—]

The end of the account is lost
connected ζ, cf. Plates I and III

2. The abbreviation consists of two

(1) A small fragment, situated at the upper edge of E, has been misplaced (and also turned the wrong way round). It belongs to the upper edge of A.

1. Sheet A-B has no general heading. This is a further proof that it has been preceded by sheet F-I. The name *Μανωγαῖς* seems to be derived from *Μανώγιος* (cf. *Μανωγιεύς* and *Μανωγιεύς* in Ptolemy's *Ναυπηγική*, cf. also *Μανωγαῖς*, *O. Papy. Bodl.* II, 140).

2. The term *ἐπιζεύειν ζῆα* also appears in *P. Cairo Masp.* 67279 (cf. 570). The transport *asses* referred to by *ἐπιζεύειν* is likely to have been the second troop, whose maintenance during Plinimouth-Payni is dealt with in II 14. In II 2, 10, which probably refers to the same animals, they are called *τροχόα*. The provisions, mentioned in II 2, 3, 7, 8 (the indication of their amounts has been lost), must have covered the expenditure of 206 *gamai*, recorded in II 14, 3.

3. *διὰ τὴν ἀγκυράειαν* is to be compared with II 2, 10. In our document the term *ἀγκυράειαν* seems to refer exclusively to the donkey-drivers of the first troop. The hay they transported would not be consumed by their own animals (1) but would be delivered to the donkey-drivers of the 2nd troop. The provisions recorded in II 2, 7 and 8 seem to have been conveyed by the recipients themselves.

4. The term *ἐκτροχάειαν* seems to have kept its diminutive meaning, for the *ἐκτροχάειαν* in question are likely to be identical with the *τροχόα* whose feeding during Plinimouth-Payni has been recorded in II 14. According to II 14, 1 their consumption of hay amounted to 120 *gamai*. The expenditure was covered by c. 20 *gamai* obtained from Petos and 108 *gamai* obtained from Phil (cf. II 2, 11).

5. This entry probably concerns a delivery which had taken place at the beginning of the 8th year, and had been taken into account already (2). Menis, a donkey-driver of the first team, had been in charge of the transport.

6. Again a delivery which had been taken into account already.

7. The name does not appear in Ptolemy's *Ναυπηγική*. It may be identical with *Ἰάκμος* (3). Anis very probably belonged to the retainers of the estate. He does not reappear elsewhere.

(1) In that case the entry would be formulated: *πρὸς ἀγκυράειαν*.

(2) It probably has been mentioned in I G. 1. 3.

(3) Mentioned in *Ital.* 13th-15th century and elsewhere.

11. Again a delivery which had taken place at the beginning of the 8th year. This time however it had not been taken into account on sheet I, for the entry is not erased. As far as sheet II is concerned, accounts of expenditure during the initial months of the year (II 6, II 16, II 19, 2) always deal with the maintenance of *ping*. *loulinos* is therefore likely to have been *pingzhi* (*).

12. Identical with I, 5, and again erased.

13. Only the name *loulinos* can be read with certainty. If our interpretation of I, 11 is correct, I, 13 must concern again the maintenance of *ping*.

14. The name does not appear in Priestow's *Namenchih*; P. Har. 1 78, 4 (5th-6th century) has *Maofing*, *Stud. Pat.* N 156, 12 *Apofing*.

15. *Isakas* will be mentioned again in II 7, 1 (where he is called *amozinger*) and in II 9, 11.

16. The meaning of this entry is very obscure. As our document is dealing with receipts and expenses of the 8th year, a delivery «on behalf of the 1st year» is rather unexpected.

The first account of sheet II may have continued up to the bottom of section 1. It is, however, more likely that the lower half of section 1 has been covered with a second account, of the same type as II 1 (account of receipts of the first class, cf. p. 10).

Section 2

This section has entirely disappeared. It probably contained further accounts of receipts of the first class.

(*) II 1 is an account of receipts of the first class; its total has consequently been included in the 2nd group of II 12. *loulinos* must therefore have been in charge of a troop of oxen whose maintenance is dealt with in II 13-20, i.e. the 2nd, 3rd or 4th group.

SECTION 3

Fragment B: upper half of the fragment: 5 × 15,8 cm.; lower half (1): 5,6 × 12 cm. As a complete section would have measured 8 × 28 cm., a substantial part of section 2 has been preserved. A few lines of the writing (II 2, 6, 8, 9, 11) were projecting to the right and are (partly) preserved in section 4 (fragment C).

- II 2 1† λέ(γας) γόρτ(ον) Φίβ(ιας) η ἐνδ(ικτίοτος)
 • Φαρμοῦθ(ι) κ• γ(όμ.) .[.]
 κ• γ(όμ.) π[.]
 κα• γ(όμ.) π
 5 ταύ(ραν)• γ(όμ.) ἐς
 τῶ(ν) αὐτ(ῶν)• γ(όμ.) σκβ .[..... γ(όμ.) κ ἀγκ() ἐς
 μου(αυτῶν) ζ• γ(όμ.) σιβ
 Φαναμ(ίτι)• γ(όμ.) ρμη [.....]ρωγ.ζ() γ(όμ.) κ ἀγκ() ἐς
 ..μ() Φαναμ(ίτι)• γ(όμ.) ρη [.....].
 10 • δι(α) τῶ(ν) ἐπο(ι)ζ(ι) γ(ίον) ζ(ῶον) γενοχ(ικῶν) γ(όμ.) ρ.
 • ἐπτοχ(ίον) γ(όμ.) ρη [.....]επο(ι)ζ() γ(όμ.) κ ἀγκ() ἐς
 κζ• γ(όμ.) σιβ
 Βίχτορ(ι) γ(όμ.) ρστ
 (καί) ὁμ(αίος) γ(όμ.) τ μ(αίος) [ρσ]
 15 (ὁμοῖ) γ(όμ.) ἀλ(α)τ(η) μ(αίος) ἀλ(α)τ(η)
 (καί) ..() .() β γ(όμ.) ρ (ὁμοῖ) αὐ(δ)
 ἐξ() ἀποστολ(αί) τδ

9. ὁμοῖος is not convincing from the palaeographical point of view.

11. The reading of the end of this line on Plate III will be complicated by the fact that the upper half of fragment 2 should be moved a few mm. to the right.

(1) The lower half of the fragment has not been put in its exact position; it should be moved 0.5 cm. to the right

1. Phila also appears in II 20, II 21 (where is called a *yaupphic*) and II 22. His deliveries amounted to 1044 *manin* (l. 16). They are part of the c. 1670 *manin* which, according to II 12, 1 were obtained from Tu Skeles.

2-4, cf. I 2, 2 and 9, discussed on p. 43.

5-6. These deliveries are likely to have been made for the maintenance of the second troop of bulls, whose feeding during Pharmouthi-Payni is described in II 17. Their consumption during these months amounted to 291 *goun*; the total of Phila's deliveries was 288 *goun*. The total of 4 is has to be read *yauph ephannepheion* $\frac{1}{2}$; the meaning of these 20 *ankalar* *goun* has been discussed on p. 29. The connection between Phila's deliveries for the maintenance of bulls and the 46 *goun* mentioned at the end of l. 6 is not clear, because we are unable to read in II. 8 and 11 the term which was used to introduce a delivery of 67 *goun* *e phannepheion*. These additional deliveries apparently have not been included in the total of l. 15.

7. If our reading is correct, the provisions in question have been delivered for the maintenance of 6 oxen. They must be identical with the reinforcement added to the first troop of oxen from at least 1st Pharmouthi onwards, cf. II 18. Their consumption during Pharmouthi-Payni amounted to c. 20×90 *ankalar* = 216 *goun*. Phila's contribution consisted of 242 *goun*.

8-10. According to Perischoke's *Namenbuch*, *Phanphic* is an alternative spelling of *Hannephic*. Phanphic will appear again in II 20, in a receipt which is connected with II 19. He seems to have kept the fourth team of *paiz*. Phila's deliveries to Phanphic amounted to c. 326 *goun*; the provisions of the first two entries seem to have been transported by Phanphic himself, those of the third entry by the drivers of the 2nd troop of asses (*paiz* *paiz* *yaupphic*); we have found something similar in II 1, cf. our commentary on l. 3. Expenditure for the 4th troop of *paiz* during Pharmouthi-Payni amounted, according to II 19, 6, to 321 *goun*. The significance of the 67 *goun*, mentioned at the end of l. 8 is not clear; cf. our commentary on II. 5-6.

11. Cf. our commentary on II 1, 4.

12. Probably a delivery that was made for the same purpose as those that were recorded in II 2-4.

13-14. These are the only entries which have not been checked off by the author. In spite of this, they are likely to be related with some account of expenditures, belonging to the series II 13-19.

16. The 100 *gamai* have been tacitly converted into 50 *masia* and added to the total of 900 *masia* of I. 15. There may be question of two earls, containing 50 *gamai* (i.e. $12\frac{1}{2}$ donkey-loads) each.

17. $\frac{1}{2}$ (cf. I 6, 10, 13) may be the number of expeditions required by the transport of 1938 *gamai*. The provisions carried by the $\frac{1}{2}$ *gamai* *jeon jeon gaeon* (I. 10) for example cannot have been transported in the course of a single expedition for, at the time of their conveyance, only three *jeon jeon gaeon* were kept at the estate of To Skelo (cf. II 14, 1), and the bearing power of a donkey did not exceed 1 *gamai* (cf. p. 28).

II 3 $\frac{1}{2}$ *gamai* *jeon jeon gaeon* |
 $\frac{1}{2}$... *jeon jeon gaeon* | (I. 10) *jeon jeon gaeon* |

1. *jeon jeon gaeon* | | *jeon jeon gaeon* | | *jeon jeon gaeon* | | *jeon jeon gaeon* |
 2. *jeon jeon gaeon* | | *jeon jeon gaeon* | | *jeon jeon gaeon* | | *jeon jeon gaeon* |
- on p. 22

II 4 $\frac{1}{2}$ *gamai* *jeon jeon gaeon* | 5 *gamai*

jeon jeon gaeon cannot be read

This note deals, in our opinion, with another instance of barter. In II 15 540 *gamai* of hay were exchanged against a certain quantity of chaff and two kouru of a product which has not been specified. II 4, on the contrary, seems to record the exchange of 120 *sphyrina* of a certain product (we are unable to read its name) against 120 *gamai* of hay. We do not know if these 120 *gamai* have been included in the total of receipts which is mentioned in II 12, 1.

II 5	$\tau\epsilon\sigma\sigma\epsilon\tau(\epsilon_1)$	$\beta\alpha\tilde{\alpha}\tilde{\alpha}\tilde{\alpha}$	$\Sigma\kappa[\lambda\alpha\tilde{\alpha}(\alpha\alpha)]$
	$\lambda\beta\beta\alpha\alpha\alpha\mu$		$\gamma(\alpha\alpha) \delta$
	$\Sigma\kappa\beta\beta\alpha\alpha\alpha$		$\gamma(\alpha\alpha) \delta$
	$M_2\epsilon\tilde{\alpha}\tilde{\alpha}$		$[\gamma(\alpha\alpha) \delta]$
	$\tilde{H}\lambda\alpha\alpha$		$[\gamma(\alpha\alpha) \delta]$

2. Abram is also mentioned in II 9, 16 and 23, II 11, 2.

3. Seretes will appear again in II 11, 3.

4. Menas : cf. our commentary on I 1.

5. Elias will be mentioned again in II 6, 5, II 7, 4-5 (here he is called $\epsilon\lambda\epsilon\gamma\alpha$, II 8, 5) $\tilde{H}\lambda\alpha\alpha$ $\tilde{M}\alpha\alpha\alpha\alpha$ and II 20, 10.

This is an account of receipts belonging to the 2nd class (cf. p. 10). The four persons in question were donkey-drivers, each of them seems to have made a single expedition with a single animal (cf. bearing power of asses). These small provisions were probably delivered to the $\beta\lambda\epsilon\gamma$ of the first term, and would be consumed during the initial months of the year. They were completed by further deliveries which are mentioned in II 6, 10. The maintenance of the 1st troop of $\beta\lambda\epsilon\gamma$ during Pharmouthi-Payni seems to have been secured by deliveries recorded in II 11, an account which resembles the present account. The first group of $\epsilon\lambda\epsilon\gamma$ seems to have been distinguished from the other troops by the specification $\Sigma\kappa\lambda\alpha\alpha\alpha$; it may have the same value as $\epsilon\mu\tau\alpha\alpha$ in II 1, 2, 7 and 8, and $\gamma\alpha\sigma\chi\alpha\alpha\alpha$ in II 2, 10.

II 6	1	$\theta\alpha\tilde{\alpha}\tilde{\alpha} \gamma \epsilon\tilde{\alpha}\tilde{\alpha} \gamma \epsilon\tilde{\alpha} \beta\alpha\tilde{\alpha}\tilde{\alpha} \Sigma\kappa\lambda\alpha\alpha\alpha$
		$\tau\epsilon\sigma\sigma\epsilon\tau(\epsilon_1)\gamma\alpha\alpha\alpha\alpha \gamma\alpha\alpha\alpha\alpha\alpha\alpha \gamma \lambda(\alpha\alpha\alpha) ; (\alpha\mu.)[\eta \alpha\gamma\alpha(\alpha\lambda\alpha) \mu]$
		$(\alpha\alpha\alpha)\alpha\alpha \dots \epsilon\tilde{\alpha}\tilde{\alpha} \gamma \gamma \mid \dots$
		$\Phi\alpha\tilde{\alpha}\tilde{\alpha}\gamma \gamma \gamma \alpha \delta \mid \dots$
	5	$\alpha\gamma \tilde{H}\lambda\alpha\alpha \dots$
		$\alpha\epsilon\epsilon\tilde{\alpha} \gamma \gamma \mid \dots$

As the previous account (II 5) reaches the lower limit of the author's writing area, there is no doubt that the present account is a later addition. It seems as if the author originally intended to give first a complete survey of receipts (both classes, one after another) and af-

terwards a survey of expenditure. After II 7 and II 8 (which, like II 6, belong to the second class of accounts of receipts), he changed his mind and gave immediately the related account of expenditure (II 9). He went on in a similar way until II 11 and its related account (lost in section 8, recto). He then calculated the total of receipts of the first class (II 12) and gave, in II 13-19, a survey of the expenditure they had covered. On responding to a text mentioned: 1. that he had not given a complete list of the provisions that had been delivered for the maintenance of *plēz* *ἡλικίων* during the first months of the year; 2. that the consumption of these provisions had nowhere been recorded. His double omission was repeated in II 6, which probably went on in the lower margin of column 1, with a survey of consumption during Phlophai and possibly also Hathyr.

As 7 *qomai* 10 *ankufai* are the total consumption of a single day (7th Thoth) the troop in question must have contained 18 animals (4). The author originally calculated the consumption of 19 animals and consequently obtained a total of 7 *qomai* 11 *ankufai*.

During Thoth the *qomai*, *ankufai* of the first troop of *plēz* appears to have been limited to a couple of days. The problem of the animals' maintenance during the initial months of the year has been discussed on pp. 25-6.

SECTION I

Fragment C: contains an important part of the upper half of the section, and a small part of the lower half: 7 = 18,5 cm.; cf. Plate III. Some of the lines that appear in section I are a continuation of the writing in section 3 (cf. II 2, 6, 8, 9, 11).

II 7 1 [†] λ[α](γ[ο]ζ) ἡλικίων(α) σ[τα]θ[ι]κ[ι]ν(α)
 [π]α[ρ]α[ρ]α[ρ]α γ[α]λ[α]κ[τ]ῶν καὶ ἡ
 [α]ν[α]ν[τ]ῶν(α) ἡλικίων(α) ἡλικίων(α) γ[α]λ[α]κ[τ]ῶν(α) καὶ
 [λ]α[ρ]ῶν(α) καὶ ἡλικίων(α) [α]ν[α]ν[τ]ῶν(α) ἡλικίων(α) καὶ ἡλικίων(α) καὶ ἡλικίων(α)

(4) The usual daily ration of *plēz* amounts to 2-2.5 *ankufai* per head.

II 8, 5) and Phothamman (recipient in II 8, 2) were donkey-drivers. If our reading of l. 1 is correct, τὰ δ' αἰγὰς must refer to the animals that were bought on 1st Phyn. (cf. II 9, 10; cf. II 2, 7 which also concerns a delivery for the same number of animals that had been added to a certain troop).

Section 5

Fragment D: preserves an important part of the upper half of the section (7.5 - 11.5 cm.) and a small part of the lower half (1.5 - 4.3 cm.) (5). Cf. Plate III.

- II 9 1 † ε[ρ]ο[υ] (6) ἀνελαιόμεν η' ἀδελφεοί (7)
 τροφ(6) (ἀπο)διδόμεν δίδωμεν ἀπὸ ἀγρ(7) εἰς τοὺς ἀπὸ
 ἀποδοθῆναι α)
 τοὺς λ' ἡγεῖται (ἀποδοθῆναι εἰς [γὰρ] ἀποδοθῆναι γὰρ γ'
 [ἀγρ(7) α] γὰρ εἰς τοὺς αὐτοὺς ἀγρ(7) δ'
 (αὐτὸ) ἀπὸ τοῦ α' ἀποδοθῆναι δίδωμεν εἰς [γὰρ] ἀποδοθῆναι
 αὐτοὺς γὰρ εἰς δ' ἀγρ(7) α)
 5 γὰρ αὐτοὺς γὰρ γὰρ ἀγρ(7) λ' [ἀγρ(7) ἀπὸ τοῦ α'] ἔπειτα
 ἀπὸ τοῦ Σιδόνας |
 ἔπειτα η' ἀπὸ Μοῦχ(7) |
 α' ἀπὸ Βουαγ(7) |
 α' ἀπὸ Βουαγ(7) |
 10 Μοῦχ(7) α' ἀπὸ Βουαγ(7) |
 ε' ἀπὸ Βουαγ(7) |
 ἀπὸ τοῦ ἀποδοθῆναι ἀποδοθῆναι ἀπὸ Μοῦχ(7) |
 αὐτοὺς ἀπὸ Βουαγ(7) |
 α' ἀπὸ Μοῦχ(7) ἀπὸ τοῦ ἡγεῖται |
 15 α' ἀπὸ Βουαγ(7) |
 λ' ἀπὸ Μοῦχ(7) δίδωμεν Μοῦχ(7) |

(5) The fragment of the lower half has not been removed in its exact position. It ought not to touch the fragment with a distance of ca. 0.5 cm. seems likely and should be moved 1.2 cm. to the left.

..... χ[άσ]τι(ον) ἰσθ[ικ]τι(ον) [— — —
 [.] Μ[η]τῶ χ[ο]ρ[ι]τα() [— — —
 [.] ἀπὸ τοῦ Μελέτιου(ος) [— — —
 20 [Θωθ . ἀπὸ τοῦ Μ[η]τῶ(ος) [— — —
 [.] Μ[η]τῶ χ[ο]ρ[ι]τα()]
 [Φ]ωθ(ι) κα[ὶ] [— — —
 καὶ Ἀβ[ε]λ[ι]μ[ι] — — —

3 The author first wrote $\chi\mu\theta\epsilon\zeta$ γι and consequently was about to omit the total of daily consumption. 14 Not ἀπὸ

The right half and the end of the account are lost. The width of II, 3-4 may be reckoned at 9 cm. As the writing starts at a distance of 1.5 cm. from the left edge of section 5, lines 3-4 must have covered section 6 over a distance of $(1.5 + 6) \times 2 = 15$ cm. The sections, resulting from the folding of our document, had a width of 6 cm., cf. p. 9.

TRANSLATION (II, 1-5):

Maintenance of donkey drivers during the 8th indiction. Feeding of 11 pack-donkeys, receiving 12 bundles, during 60 days extending from 1st Pharmouthi until 30th Pachon, at a daily expenditure of 3 loads = 18 bundles; 201 loads = 30 bundles. And on 1st Payni 4 animals were bought; daily expenditure: 4 loads = 16 bundles, total: 129 loads / 30 bundles. From Epiphi onwards they have taken delivery of:

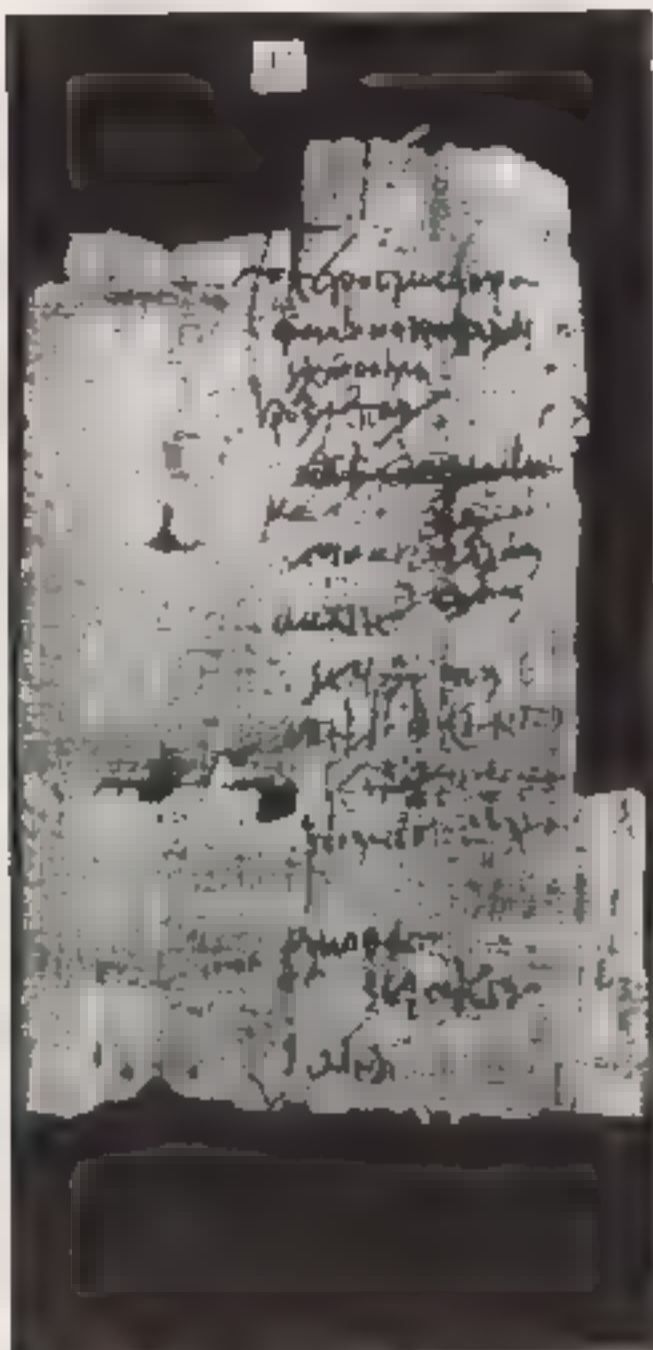
4. 4 gamai 10 ankai: daily consumption of 14; 4 asses, receiving 12 ankai per head.

5. During 1st Pharmouthi-30th Payni the first troop of asses consumed 201 gamai 30 ankai = 129 gam. 30 ank. = 331 gam. 10 ank. The sum total has not been made by the author of our document. $\epsilon\chi\omega\sigma\tau\epsilon\ \alpha\pi\omicron\ \mu\eta\theta\epsilon\zeta\ \epsilon\kappa\epsilon\iota\gamma$: from here onwards, anticipation of year 9 begins. Cf. p. 11.

14. The entry concerns a delivery of the same type as those that are recorded for the 8th year, in II 7. The meaning of ἀπὸ() is obscure.

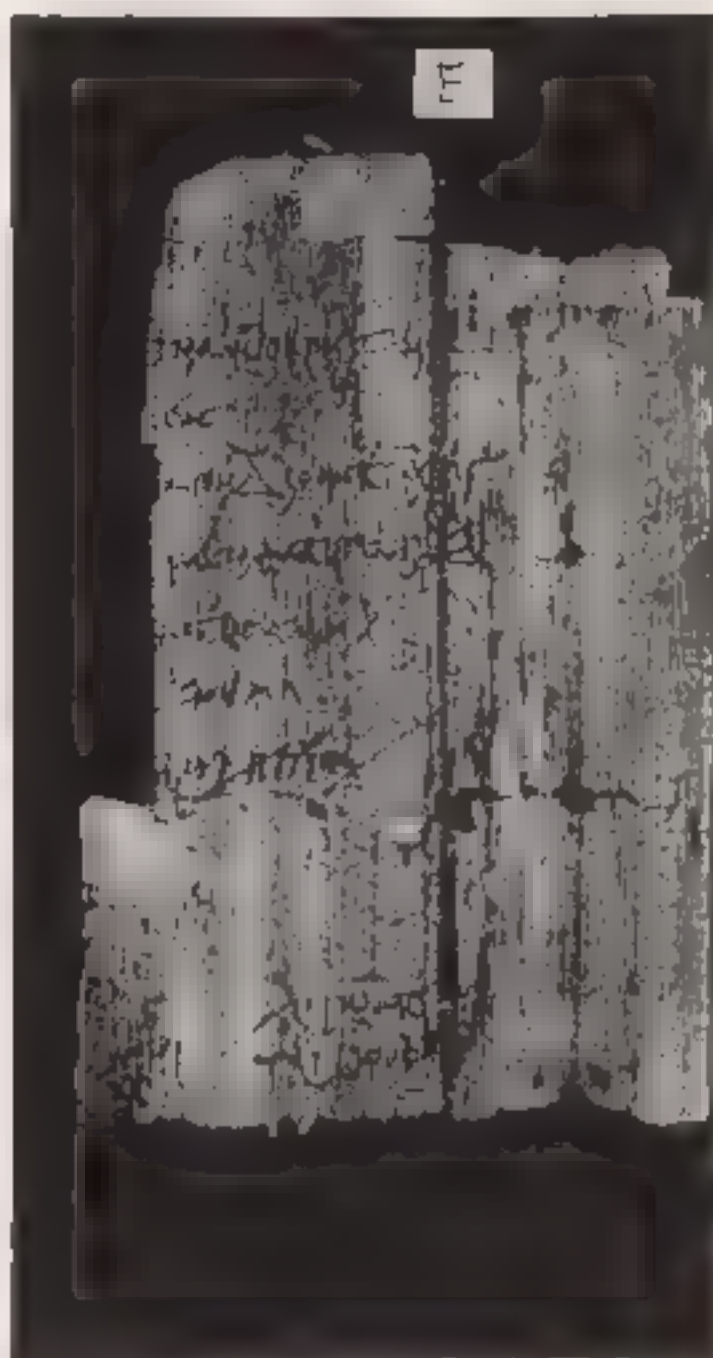
16. $\chi\iota\theta\iota\sigma\tau\epsilon\ \alpha\lambda\lambda\alpha\sigma\iota\mu$: either « (conveyed) by A.'s animals » or « (delivered) for (the maintenance of) A.'s animals ». The first solution is preferable. Part of the provisions obtained from elsewhere appears to have been transported by the recipients themselves, cf. also II. 18, 21, 23,

PLATE I



SECOND SHEET, SECTION I, RCG14
(Xenophon II 4)

PLATE II



SECOND SHEET, SECTION 1, verso
(Accounts II 22, 23 and 24)

17. ζ ἰσθ. : this is a further proof (cf. pp. 26 and 28) of provisioning difficulties at the beginning of the year. Whether the provisions in question were received or bought, they were of inferior quality, for hay that had been produced as long ago as the 7th year, must have become soggy and dusty, and must have lost to a large extent its feeding value.

18 and 21 are probably dealing with provisions that had been conveyed by Menas. Although ζῶον has no mark of abbreviation, it can hardly be considered as a heteroclitie plural of ζῶον. The meaning is obscure.

SECTION 6

This section has entirely disappeared. It contained the right end of II 9, 2-4, which can easily be restored, and, next to it, a narrow column, whose loss is rather unfortunate, for it probably recorded the provisions from which the expenditure of II 10 was made. The existence of this column is proved by the fact that faint traces of writing are visible at the left edge of section 7. They cannot belong to the right end of II 9, because the writing of that account cannot have extended over 13,5 cm. (1); its maximum width did not exceed 9 cm., cf. p. 50.

SECTION 7

Fragment A : upper half of the fragment : 6,8 - 16 cm. (2), lower half 0 - 11,5 cm. The major part of this section has consequently been preserved.

II 10 :
 (ἐπεὶ) Φαρμοῦθ(ι) οὐ—
 † ἔχουσιν σταλῖν(αι) . . . [. . . τριπλῆ) μονοκλῖνον) αὐτὸ ἀπὸ
 ἀγροὶ καὶ ἀπὸ Φαρμοῦθ(ι) ζῶν]

(1) 8 - 13,5 cm. of section 5 (cf. note on II 9) - 3 cm. of section 6

(2) The right-angled tear at the upper edge of this fragment should be filled up with a small fragment which has been wrongly connected with E., cf. p. 50, n. 1.

ἔως Παχίων καὶ ἡμεροσάβως γόμ' ε [ἀγκ' ἄς γί(νε)ται γόμ'
 τκβ ἀγκ' κη -- --]
 εἰς α ἀπὸ ἀγκ' κ ἔως [Ἡσῶν ἃ ἡμεροσάβως) γόμ' ε γί(νε-
 ται) γόμ' σις (ἡμῶν) γόμ' η ἄγκ' κη]
 δ γί(νε)ται ἀπὸ α (ἀπὸ α) τῶν Φαρμοῦ[9(α) ἃ ἔως Ἡσῶν ἃ
 ἡμεροσάβως) πὸ γόμ' . . ἔχουσιν]
 Ἐπὶ ε ἀπὸ Βουσιῶ[4(α) γόμ' α καὶ δ[πὸ -- --
 -- -- -- (ἡμῶν)]
 γόμ' πὸ ἡμερῶν ἔχει γόμ' ἄς ἔως γόμ' . . (ἡμῶν)
 γόμ' . . ἡμερῶν ἔχει γόμ' . .]
 εηδ
 α γ ἀγκ' κβ

1. The initial line of this account seems to have been a heading, comparable with II 6, 1 and II 19, 1. ἔως Φαρμοῦθι appears to have been followed by a number of the animals whose *double loads* would be dealt with in the account. It is probably consisted of an *adjective-noun* (7), followed by *number* (α), the top of (α) . . . which would have been filled. 2. after *πῶς* *Ἡσῶν* a word like *ἡμεροσάβως* or a *chronological term* will have to be restored; *πῶς* *Ἡσῶν* *ἡμεροσάβως* *ἡμεροσάβως* will do.

This column seems to have been *inscribed* over a 14 cm. It begins at a distance of 1.7 cm. from the left edge of section 7 and in it consequently have covered *σπῆμα* *σπῆμα* *σπῆμα* *σπῆμα* *σπῆμα* (1,7 + 11 + 15,2 cm.; section 7 + section 8 = 26 cm.).

TRANSLATION:

On account of Pharioouthi . . . The stablemen have taken delivery of . . . loads. Feeding of 14 mules, receiving 24 bundles, from 7th Pharioouthi, until 20th Pachon, at a daily expenditure of 6 loads. 36 bundles: 122 loads 28 bundles. For 15 animals, receiving 20 bundles, until 30th Pagnai, at a daily expenditure of 6 loads. 216 loads. In all: 538 loads + 28 bundles. They ought to receive on account of the 44 days extending from 7th Pharioouthi until 30th Pagnai . . . loads. They have received from Bousiris on 5th Epeiph 24 loads and from . . . loads and from . . . loads, in all: 201 loads. He has a surplus of 36 loads, and until (e.g.) 1st Mesore . . . loads, in all . . . loads. He has a surplus of . . . loads.

1. *ὑπερ Φαρμωθῆ*: in actual fact, the account deals with Pharmouthi-Payni. The heading merely intends to distinguish the present account from a former one (belonging to sheet I) which dealt with the animals' maintenance during the initial months of the year.

2. In our document *ἔχου* is always used in connection with receipts (cf. II 9, 5; II 18, 1; II 21, 8 and 15), not with animals. In the present case *ἔχου* was probably followed by a total of receipts: *μικραποδῶν* *αἰ*, *ἀγρῶν* *αἰ*: the restoration is based on the short note that has been written under the account: *αἰ ἀγρῶν* *αἰ*. This is twice the daily consumption of 11 animals, receiving 22 *ank* per head.

3. The total of consumption may have been followed by a short mention of the troop's reinforcement.

5. If our restoration is correct, one ought to understand «on account of the 81 days between *φάρω* should be understood 7th Pharmouthi and 30th Payni». In any case the sum introduced by *πρετῶν* *ἀγρῶν* must have been owed to the *stathlar* by the estate⁽¹⁾; if I. 5 were calculating the total of consumption during Pharmouthi-Payni, it would be introduced by *(ἀγρῶν)*. *ἔχου* introduces the author's anticipation of the 9th year, cf. II 9, 5.

7. *γὰρ* *αἰ*: rather a sum total of receipts than the amount of an individual receipt. *ἀποδοῦν* *ἔχου*: a transition from the plural (cf. I. 2) to the singular also occurs in II 21.15, 201-30: 168 *gama*; this amount might be interpreted as being the total of consumption of 15 animals during 28 days (1st-28th Epiphi, if we were sure that the arrears of the previous period have not been recovered out of these 201 *gama*). Anyway, it is interesting to notice that the author knew the total of consumption after 1st Epiphi, although he did not calculate or mention it explicitly. The same applies to his accountancy in II 14, 6 and II 18, 5. The calculation of the surplus had to be erased because the author (in his usual hurry) had forgotten a number

(1) The total of receipts mentioned in I. 2 does not seem to have been sufficient to cover the 300 *gama* 28 animals of I. 1. Paid-owed by the estate to its *stathlar* were introduced by *πρετῶν* *ἀγρῶν* in the present account and in II 14, 6; by *ἀγρῶν* *ἀγρῶν* in II 19, 5.

of receipts. Instead of mentioning them individually, with their proper dates, he seems to have written: *ἔλαβ' (ε.μ.) Μεδοπύ* α⁽¹⁾ followed by the total of the omitted deliveries.

ε.μ. is a first isolated note. It may refer to the total of omitted deliveries. In that case the end of l. 7 could be restored: *γὰρ ε.μ. (όμοσ') γὰρ τῇ δουλείᾳ ἔχει γὰρ αὐτ.*

ε.μ. ἀντ' αβ: cf. comm. l. 2. As there is nowhere question of 14 animals receiving 21 *ank.* per head for a period of 48 days, the question arises why this note has been written down. In our opinion, it was part of an effort to check the correctness of the total mentioned in l. 3. To find the multiplication sum of 6 *gamm.* 36 *ank.* × 48 (total of days between 7th Pharmouthi and 24th Pachon) the normal procedure would have been to convert 6 *gamm.* 36 *ank.* into 36 *ank.*, multiply 36 with 48, and divide the sum thus obtained by 30. The quicker way was the following: to consider the result of the first operation as 36 *gamm.* (instead of *ankula*) and to subtract from it twice the multiplicand. *ε.μ. ἀντ' αβ* (6 *gamm.* 36 *ank.* × 2) has been automatically written down by the author in the course of his mental calculation.

II 11 1 *λόγος) χορηγίας) τελεσθέντος βούλης) Σακεδων)* .[
Ἀφροίμ γόμ.) εἰ
Σαφῆρος γόμ.) σο. εἰ
Φαυδάρμ(ων) γόμ.) α
 5 *Μηνάς* σα. εἰ
(όμοσ') ωξην μ(όστου) εἰδ

3. After *σο* an additional delivery of 11 *gamm.* seems to be recorded. As opposed to the additional deliveries * of II 2, it has been included in the total of 808 *gamm.*

The account deals with the same troop of *παῖς* as II 5 and very probably concerns their maintenance during Pharmouthi-Payni⁽²⁾. The

(1) Cf. II 22, 2.

(2) 5th or 7th Pharmouthi - 10th Payni, like the other troops of the series II 10 - II 17.

related account of expenditure was probably situated to the right of II 11, and has disappeared together with the rest of section 8.

II 12 $\mu\acute{o}\nu\iota\sigma\iota\varsigma\ \beta\theta\tilde{\epsilon}\tilde{\zeta}$
 $\epsilon\tilde{\iota}\tilde{\iota}\)\ \epsilon\iota\tilde{\zeta}\ \tau\acute{o}\ \Sigma\acute{\alpha}\lambda\lambda\alpha\varsigma\ \mu\acute{o}\nu\iota\sigma\iota\varsigma\ \delta\chi\acute{\alpha}\tilde{\iota}\]$
 $\epsilon\iota\tilde{\zeta}\ \text{Κ}\tilde{\iota}\sigma\iota\ \mu\acute{o}\nu\iota\sigma\iota\varsigma\ \nu\epsilon\tilde{\iota}\]$
 $\epsilon\iota\tilde{\zeta}\ \text{Τ}\tilde{\alpha}\lambda\tilde{\iota}\ \mu\acute{o}\nu\iota\sigma\iota\varsigma\ \mu\theta$
 $\epsilon\iota\tilde{\zeta}\ \text{Β}\tilde{o}\tilde{\nu}\sigma\eta\sigma\eta\tilde{\iota}\nu\ \mu\acute{o}\nu\iota\sigma\iota\varsigma\ \epsilon\gamma$

2 Cf. p. 14, 10.

3. The abbreviation consist of μ , with a small ϵ on top.

The account is complete.

This account summarizes the receipts that have been listed in the accounts of receipts of the first class (II 1, II 2 and a few accounts that are lost). It is related with a series of accounts of expenditure (II 13-20). II 12 has been dealt with on p. 13 and p. 21, n. 1. Cf. also p. 10.

SECTION 8

Part of its upper half was covered, up to the right edge, by II 10 (cf. supra). The rest of the upper half (facing II 11) was probably occupied by an account recording the maintenance of $\beta\acute{o}\nu\epsilon\ \Sigma\acute{\alpha}\lambda\lambda\alpha\iota\sigma\iota$ during 5th or 7th Pharmouthi - 30th Payni, and anticipating the accountability of receipts of the 9th year. Section 8 has entirely disappeared.

VERSO

SECTION 8-7 (Fragment A)

II 13 1 $[\tau\rho\omicron\gamma\tilde{\iota}\tilde{\iota})\ \kappa\alpha\mu(\tilde{\iota}\lambda\omega\tilde{\nu})\ \delta\ \tau\tilde{\alpha}\lambda\tilde{\nu})\ \acute{\alpha}\pi\acute{o}\ \Phi\alpha\rho\mu\omicron\tilde{\iota}\theta(\iota)\ \zeta\ \acute{\epsilon}\omega\varsigma\ \text{Π}\tilde{\alpha}\chi\omega\tilde{\nu}$
 $\kappa\tilde{\iota})\ \eta\mu\epsilon\rho\gamma\tilde{\iota}\tilde{\nu}\tilde{\iota}\ \mu\tilde{\iota}\tilde{\iota}\tilde{\iota}\ \eta\mu\epsilon\rho\delta\omicron\upsilon\sigma\acute{\iota}\omega\varsigma\ \gamma\tilde{\upsilon}\mu\tilde{\iota}\ \alpha\ \delta\chi\chi\tilde{\iota}\]$

- 2 (blank) γά(ριται) γόμ ρζ
 3 [...] εἰς τὸς Ηαῖτι λ' ἡμέραι λ]· ἡμεροεσθῶς)
 γόμ α ἄγκ κε γά(ριται) γ ρθ
 4 { circa 20 letters } γά(ριται) γ' α

1. $\mu\eta$, η or a correction of α or β .

Line 1 extends 1.05 cm. As it is inked at a distance of 1 cm. from the right edge of section 7, and as it must have started at a distance of 2 cm. from the left edge of section 7, $\mu\eta$, η or α is 4 cm. from the left edge of the document, i. e. was positioned about 2 cm. margin of p. 30. The writing of this account is smaller than that of II 13 and II 17.

TRANSLATION:

Feeding of 4 camels during 18 days extending from 2th Pharmuthi until 20th Pachon, at a daily expenditure of 1 load 10 bundles: 57 loads.

For 5 animals until 30th Pauni, 36 days, at a daily expenditure of 1 load 2½ bundles: 54 loads. They have received (on account of Epeiph) from . . . loads, and from . . . loads, total: 15 loads.

1. $\kappa\alpha\iota$ γ: the restoration is not certain, cf. p. 10.
2. ρζ: actually ὁ ἡμεροεσθῶς ἀνάλω, cf. p. 30.
3. The line probably opened with a short mention of the troop's reinforcement, cf. II 10, 1.
4. Probably ἔχοντες ἀπὸ . . . γόμ(ονς)· (καὶ) ἀπὸ . . . γόμ(ονς)·, i. e. anticipation of year 9. The sum of 57 and 54 does not seem to have been calculated.

II 16 1 [τρωγ(η)· γ· γεωργισῶν γ' ἀπὸ ἄγκ. α τῶν) ἀπὸ Φα]ρ-
 μωθ(η)· ε'· α' εἰς Ηαχὼν κε
 [ἡμεροεσθῶν· ἡμεροεσθῶν ἄγκ. με γά(ν) γά(μ) με εἰς
 [...]· (ῶν) ε ἀπὸ ἄγκ. α
 [εἰς Ηαῖτι λ' ἡμέραι λθ γά(ν) γόμ. α (ῶν) γόμ.] γε
 τρωγ(η)· πολλαγαίον γ
 [ἀπὸ ἄγκ. κε ἀπὸ Φαρμοεθ(η) ε εἰς τῆς α]· τῆς γόμ] καθ
 ὥστε γ' γά(ν)]

ἂ [ἐχούσαι] ἕως τῆς αὐτῆς γ'· ἀπὸ λουπῶν γόμ[μ]· ξὶ γά(ν.) (ἐπεί) μη(νός) Ἐπίτ
 [ἀπὸ] γόμ[μ]· θ' ἀπὸ γόμ[μ]· [ξ' ἕως] γόμ[μ]· πρὸ λουπῶν γά(ν.) λαβὴν
 [γόμ[μ]·...]

3. [ξ'] belongs to an interrupted line; [ξ'] is a wrong date.

The amount written to these lines is the same with that of II 13; at each line some 24 letters are missing or 20 in the present account, but its writing is smaller.

TRANSLATION:

Feeding of 3 pack-donkeys belonging to the estate and receiving 15 bundles, during 50 days extending from 7th Pharmouthi until 26th Pachon, at a daily expenditure of 15 bundles = 15 loads. For 5 animals, receiving 15 bundles, until 30th Pappi, 51 days = 51 loads. In all, 96 loads. Feeding of 3 young foals, receiving 25 bundles, from 5th Pharmouthi until the same day = 129 loads. Total (?): 710 loads. Until the same day they have taken delivery of 289 loads; surplus: 64 loads. On account of Epephi they have received from . . . 9 loads and from . . . 7 loads, in all, 16 loads. They ought to receive (on account of Epephi) a remainder of . . . loads.

1. ἐπὶ τοῦ(ἐπὶ) τοῦ(ἐπὶ) γουγίαν; our restoration is based on the distinction, made by the author, between ἐπὶ τοῦ(ἐπὶ) τοῦ(ἐπὶ) ἀνδρα-
 τῶν (cf. II 1, 3 and also II 9, 1) and ἐπὶ τοῦ(ἐπὶ) τοῦ(ἐπὶ) ἐμπερα (cf. II 1, 2, 7, 8) or γουγίαν (cf. II 2, 10). As II 9 is dealing with the maintenance of the ἐπὶ τοῦ(ἐπὶ) τοῦ(ἐπὶ) ἀνδρατῶν, the present account probably refers to the γουγίαν.

4. The end of the line τοῦ(ἐπὶ) γουγίαν γά(ν.) appears to be a later addition, because the θ of the preceding number γάθ has a prolonged cross-line, indicating the end of the line. The addition apparently gives a total, which is not the total of the expenses that have been mentioned in this account (96 + 129 = 225). It may concern the *great* expenditure for the maintenance of ἐπὶ τοῦ(ἐπὶ) τοῦ(ἐπὶ) γουγίαν and ποῦλῶν.

5. γά(ν.) (ἐπεί) μη(νός) Ἐπίτ: anticipation of year 9.

In section 8, at the left of II 15 and II 16, a narrow account is missing. It dealt with the maintenance during 5th Pharmouthi - 30th Payni (cf. II 16, 1: ἐμείζον πρ) of the two troops of *poiee* whose feeding during Phaophi-Hathyr is dealt with in II 16. The sum total of expenditure, recorded in the lost account, amounted, according to II 16, 1, to 120 *apomata*. Anticipation of the 9th year seems to have been omitted; it was probably recorded in II 24.

II 15 ἀναλόματα

ἐμείζον ἀναλόματα καὶ ἐμείζον
 ἐμείζον ἐμείζον ἐμείζον ἐμείζον
 ἐμείζον ἐμείζον ἐμείζον ἐμείζον

II 16 1 ἐμείζον ἐμείζον ἐμείζον ἐμείζον
 ἐμείζον ἐμείζον ἐμείζον ἐμείζον
 ἐμείζον ἐμείζον ἐμείζον ἐμείζον
 ἐμείζον ἐμείζον ἐμείζον ἐμείζον
 5 ἐμείζον ἐμείζον ἐμείζον ἐμείζον
 ἐμείζον ἐμείζον ἐμείζον ἐμείζον
 ἐμείζον ἐμείζον ἐμείζον ἐμείζον
 ἐμείζον ἐμείζον ἐμείζον ἐμείζον

TRANSLATION:

Expenditure. Account of expenditure during the 8th indiction. Price of chaff, 100 loads of hay. Price of 2 *kouria*, 500 loads of hay. 80 days, 620 loads. And on account of 6 oxen from 23rd Phaophi until 30th Hathyr, 37 days: 88 loads 40 bundles. And from 25th (Phaophi) until 30th Hathyr, 35 days, at a daily expenditure

(1) According to II 16, the troops in question must have contained 6 + 17 + 3 = 26 animals. At a rate of 20 *apomata* per head, they would have consumed in the course of 80 days 1680 *apomata*. Since the total consumption of the two troops did not exceed 120 *apomata*, it is therefore likely that the number of animals was reduced between Hathyr 25th and Pharmouthi 5th.

of 6 loads, 40 bundles : 238 loads. In all : 946 bundles, 3 oxen died ; 38 loads ; remainder : 908 loads.

II 15 concerns the use of *gama* as a means of exchange in trade-operations. 600 *gama* were exchanged against a certain amount of chalk (its weight has not been indicated) ; 540 *gama* against two *leuria* (liquid measures of incense) as proceeds.

II 16 1. At the beginning of the line an adjective, specifying the troops in question, will have to be restored. — 2. *gama* was started on 7th Pharmouthias or **II 10**, 2. **II**, 13, 1, **II 14**, 1, **II**, 17, 1.

2. *phara* ought to be set.

4. The calculation is as follows : 6 animals \times 20 *ank* = 120 day
88 *gama* 10 *ank*.

5. The author indicates neither the number of animals, nor the daily ration per head, *etc.* again a mistake, instead of *etc.*

6. 238 *gama* = 17 animals \times 20 *ank* = 340 days.

7. 946 *gama* = the exact total of 946 *gama* (18 *ank*).

8. The same note will be repeated in **II 15**, 9-10. As 94 *gama* are equivalent to almost 52 daily rations of three oxen, the three *gama* in question must have died soon after 21st Ptois. Of all the animals dealt with in our document, *gama* were at the same time the most useful and the most difficult to keep. This is the reason why Columella devoted *De Re Rustica* VI 4-19 to the maintenance of *bores*.

II 17 (ἐξ) ταύτων . . . ἡμετέρας ἀποπαινήναι ἵνα ἡμεῖς
ἐκταύμεθα καὶ ἡμεῖς καὶ ἡμεῖς
ἐκταύμεθα καὶ ἡμεῖς καὶ ἡμεῖς
ἐκταύμεθα καὶ ἡμεῖς καὶ ἡμεῖς

The accent conversion of only 13 *ank*.

TRANSLATION :

On account of 7 = *hills*, from 7th Pharmouthia until 30th Ptois, at a daily expenditure of 5 loads, 20 bundles : 278 loads. They have

received (on account of Epeiph) from 22 loads and again 25 loads, total: 47 loads.

1. *ταύροι* must have been further specified, for there were two troops of bulls. Owing to the narrowness of the available space, we have to assume that the author did not follow his usual formulation. Our restoration is based on II 16, 2-3.

2. After the indication of the total of consumption, anticipation of year 9 began. γάρμ μζ: [22] = 25 γ-μοί.

Sections 6-5 (Fragment D) (Plate IV)

II 18 1 [ταύροι] ... [] μοῖλαις ἀντιλήθης (ἐπί) μου|λαρίων
 αὐτὸ ἀπὸ ἀγκ. καὶ
 [ἡμεροσύνου] γάρμ ζ ἀγκ. ζς (καὶ ἡμεροσύνου) (ἐπί) μου-
 λαρίων ζ ἀπὸ ἀγκ. κ
 [ἡμεροσύνου] γάρμ β ἀγκ. κ ταύροι τ|ιδε] ἀπὸ Φαρμα-
 θῆς εὐς Ηοίε λ
 [ἡμεροσύνου] γάρμ αὐκ ἀγκ. μ ταύροι ἀπὸ ἑπὶ
 χοντι ἀπὸ
 5 [.....] γάρμ ἀσσε]ε λαβίε (ἐπί) ταῖς ἑπὶ
 μένους γάρμ π
 [ἔχοντι ἀπὸ] γάρμ [ἀπὸ πληγῶν] Μεσορ(ή)
 [ἔη ἀπὸ Βορ]αήρ(εως) γάρμ.) αἱ γ(ιν.) π

3 Φαρμαθῆ = cf. α η πληγῶνμεροσύνου, paid in full?

The writing of 1-3 along a line of the acanthi extended over 12 cm. It held at a distance of 1 cm. from the right edge of section 5, and must correspondingly have started at 1 cm. from the left edge of section 6. This means that there was a distance of 1 cm. between the longest lines of II 13 and II 14 (holding at 1 cm. from the right edge of section 7, cf. *supra*) and the present acanthi.

TRANSLATION:

Feeding of ... mules, On account of 14 mules, receiving 21 bundles, there has been a daily expenditure of 6 loads, 36 bundles, and again on account of 6 mules, receiving 20 bundles, a daily expenditure of 2 loads;

20 bundles. Their feeding during 90 days extending from (1st) Pharamonthi until 30th Payni amounts to 120 loads 40 bundles. Feeding from Eipaph onwards : they have taken delivery of . . . loads from . . . , so that they ought to receive on account of Eipaph 81 loads. They have received from . . . (32 loads, fully delivered in Mesore, 48 loads and from Boussirix 12 loads, total : 80 loads).

1. *pendulum*: the word was probably preceded by a specification of the animals in question, for there were two troops of males.

4. This is the sum of 691 *grom*, 10 *ank*, 113 animals + 21 *ank*, 3 90 days) + 216 *grom* (6 animals + 20 *ank*, 100 days). The total was followed by *επεμύειν* *ἔτι* *ἔτι*, introducing the author's anticipation of the 9th year.

5. Although the author does not mention the number of *gerani* consumed during Eipaph, he apparently knows it, for he is able to calculate that the animals' consumption exceeded the mule-herds' receipts to an amount of 81 *gerani*. Cf. our commentary on II 10, 7.

4-7: record the payment of the attacks. Apparently they have not been repaid up to the last *gottos*.

II 1B 1 [τρωγ(ή) βασιλευσίν] ... [εὐδαιμονίᾳ]
 [τρωγ(ή) βασιλευσίν] αὐτῶν ἀγὰρ καὶ αὐτῶν ~~βασιλευσίν~~ καὶ εὐδαιμονίᾳ ...
 [ἐμμετροσύνῃ] γάρ. ὁ ἀγὰρ καὶ γὰρ. γάρ. γὰρ ἀγὰρ ὁ γὰρ ...
 γάρ. γάρ. γὰρ αὐτῶν εὐδαιμονίᾳ ...
 [ἐμμετροσύνῃ] μὴ ἐμμετροσύνῃ γάρ. ὁ ἀγὰρ ὁ γὰρ γὰρ ...
 αὐτῶν ἀγὰρ καὶ ~~βασιλευσίν~~ γάρ. ἀγὰρ
5 [ἀγὰρ καὶ ... τρωγ(ή) τῶν] αὐτῶν Φαίωνα θῆται αὐτῶν ~~βασιλευσίν~~
 [ἐμμετροσύνῃ] αὐτῶν ἐμμετροσύνῃ γάρ. ὁ ἀγὰρ αὐτῶν γὰρ. γὰρ αὐτῶν
 [τρωγ(ή) αὐτῶν] εὐδαιμονίᾳ ἐμμετροσύνῃ ὁ ἀγὰρ ὁ
 (ἰσχυρὸν) ἀσθενῶν γάρ.
 αὐτῶν (ἰσχυρὸν) ἀσθενῶν γάρ.
 ἀσθενῶν γάρ. αὐτῶν
 ἀσθενῶν ἀσθενῶν γάρ.

The width of the column, except for 41 & 42 is the same as that of 21 19. The horizontal line may have one or two vertical ones at its left extremity, as was

the rice in section 7, verso. It is not certain if any wither has been lost between lines 7 and 8. The reading γ' 41.5.110 is not certain.

9. *zif* : the sense of the abbreviation is clear : to be subtracted = *βορὴ διὰ* = *βούδιον*, diminutive of *βόε*.

TRANSLATION :

Maintenance of cattle-herds during the 8th indiction. Feeding of 11 oxen, receiving 20 bundles, from 20 Thoth until 12th Phaophi, at a daily expenditure of 4 loads 20 bundles : 101 loads 10 bundles. Total : 922 loads. And from 13th (Phaophi) until 30th Hathyr, 18 days, at a daily expenditure of 1 load 11 bundles : 20 loads 28 bundles. In all : 1127 loads 28 bundles. Feeding during 75 days extending from 1st Pharmouthi until 15th Payni, at a daily expenditure of 4 loads 11 bundles : 321 loads. Feeding from 16th (Phayni) until 30th Hathyr, 15 days : daily expenditure of 4 loads 9 bundles. In all : 2082 1/5 measures. To be subtracted on account of 3 oxen that died : 38 loads ; remainder : 2043 1/5 measures.

1. After *ἡμετέρας* is specification of the term in question.

3. 922 *gama* : sum of 820 *gam*, 10 *ank* (cf. II 18, 4) = 101 *gam*, 10 *ank*.

7. The author's anticipation of the 9th year will be continued in II 20. Line 7 is the only example of an anticipation containing details about the daily ration per head, *ἡμετέρας* *ga* : this shows that the 9th year was a normal year, containing 5 *epagomenai*.

8. 'five' : 2082 1/5 *nomoi* are equivalent to 1101 *gama* 20 *ank*. This is the sum of the expenses which have been recorded in II 13 + II 19, as far as they were made during the 8th year (1) :

II 13	7th Pharmouthi - 24th Pachon	57 <i>gama</i>
	25th Pachon - 10th Payni	54
II 14	7th Pharmouthi - 26th Pachon	45

(1) It is absolutely certain that expenses, made during the initial months of year 9, have not been recorded in this total. The reckoning of II 18-19, which is continuous, does not take account of the data which are mentioned in II 18, 5-7.

	27th Pachon - 30th Payni	51
	5th Pharm. - 30th Payni	129
II 15	<i>anatomata</i> for trade	600
		540
	last account: 5th Pharm. - 30th Payni	620
	(cf. II 16, 1)	
II 16	24th Phaophi - 30th Hathyr	88 <i>gama</i> (40 <i>ank.</i>) (1)
	26th Phaophi - 30th Hathyr	248
II 17	7th Pharmouthi - 30th Payni	291
II 18	1st Pharmouthi - 30th Payni	820 <i>gama</i> 10 <i>ank.</i>
II 19	20th Thoth - 12th Phaophi	101 <i>gama</i> 10 <i>ank.</i>
	13th Phaophi - 30th Hathyr	265 <i>gama</i> 28 <i>ank.</i>
	1st Pharmouthi - 15th Payni	321
		-
		4164 <i>gama</i> 28 <i>ank.</i>

If our reading '*β*' is correct (the *r* is uncertain), the author has slightly simplified the sum he had to convert into *manu* (4164.20 instead of 4164.28).

These expenses were covered, as has been said, by the deliveries of the first class; they amounted to 2167 *manu* = 1334 *gama* (cf. II 12, 1).

9. In the course of his calculation, the author, on reaching II 16, seems to have taken into account the total of 946 *gama* (II 16, 7) instead of the exact total of 908 *gama* (II 16, 8). He therefore had to subtract from his 2082 1/3 *manu* 38 *gama* = 19 *manu* (2). It is also possible that the subtraction was first made in II 19, and afterwards in II 16. Line 8 of the latter account may have been inserted after the following account (II 17) had been written already.

(1) The 60 *ankata* have not been taken into account, cf. II 16, 7: 946 instead of 946 *gama* 10 *ankata*.

(2) The conversion of these 38 *gama* into 19 *manu* seems to have taken place lastly, cf. II 2, 10.

SECTION 1-3 (Fragment C (Plate IV) and Fragment B)

II 20

- 1 [† λήγοντες] το[αγ(ί)ς] Φαρμακ(ί)ας 1† τρεσ(ί)ς ταύ(ισ)ται
 [ἀπὸ] Φ[ι]λ(ί)ας γ(ό)μ(α) εἰς
 [...] καὶ ἀπὸ τ γ(ό)μ(α) δ
 [...] καὶ ἀπὸ τ γ(ό)μ(α) μῆ
 5 [ἀπὸ] Φαρμακ(ί)ας γ(ό)μ(α) καὶ 5 γ(ό)μ(α) ἐμ(ί)μ(α) οὐδ
 [καὶ] ἀπὸ Φ[ι]λ(ί)ας γ(ό)μ(α) μ ἐμ(ί)μ(α) σ(ί)ας γ γ ἀγκ(ί) κε
 [καὶ] ἀπὸ τ[αυτῶν] ἀπ(ί)σ(α)ς γ(ό)μ(α) εἰς γ(ό)μ(α) γ(ό)μ(α) σ(ί)ας
 [ἀπὸ] Φαρμακ(ί)ας γ(ό)μ(α) καὶ ἔχουσι δὲ εἰς
 [ἀπὸ] Φ[ι]λ(ί)ας γ(ό)μ(α) μ τῆς αὐτῆς
 10 [...] εἰς τὴν Ἡλ(ί)αν γ(ό)μ(α) καὶ 10 γ(ό)μ(α) ταβ
 [ἀπὸ] Φ[ι]λ(ί)ας γ(ό)μ(α) εἰς ἀπὸ Φ[ι]λ(ί)ας γ(ό)μ(α) οὐδ
 [ἀπὸ] Φαρμακ(ί)ας γ(ό)μ(α) εἰς γ(ό)μ(α) καὶ
 ἀπὸ Φ[ι]λ(ί)ας γ(ό)μ(α) καὶ ἀπ(ί)σ(α)ς γ(ό)μ(α) καὶ
 ἀπὸ Φαρμακ(ί)ας γ(ό)μ(α) καὶ ἀπ(ί)σ(α)ς γ(ό)μ(α) καὶ
 15 ἀπὸ Φαρμακ(ί)ας γ(ό)μ(α) μ 15 ἔχει Μ... ἀπὸ
 ἀπὸ Φαρμακ(ί)ας γ(ό)μ(α) εἰς Μ... ἀπ(ί)σ(α)ς
 ἀπὸ Φαρμακ(ί)ας γ(ό)μ(α) εἰς γ(ό)μ(α) μῆ
 ἀπὸ τ[αυτῶν] Μ... ἀπ(ί)σ(α)ς γ(ό)μ(α) καὶ
 [ἀπὸ] Φαρμακ(ί)ας γ(ό)μ(α) καὶ
 20 [ἀπὸ] Φ[ι]λ(ί)ας γ(ό)μ(α) εἰς
 [ἀπὸ] γ(ό)μ(α) καὶ
 [] γ(ό)μ(α) γ(ό)μ(α) καὶ
 [] καὶ γ(ό)μ(α)
 [] — — — —

II 21

- ... γ(ό)μ(α) ἀπὸ ἀγκ(ί) κε
 τ[αυτῶν] ἀπὸ Φαρμακ(ί)ας α
 εἰς Ἡλ(ί)αν α
 5 γ(ό)μ(α) ἐμ(ί)μ(α) οὐδ
 ἐμ(ί)μ(α) σ(ί)ας γ γ ἀγκ(ί) κε
 γ(ό)μ(α) γ(ό)μ(α) σ(ί)ας
 ἔχουσι δὲ εἰς
 τῆς αὐτῆς
 10 γ(ό)μ(α) ταβ
 ἀπὸ Φ[ι]λ(ί)ας γ(ό)μ(α) οὐδ
 γ(ό)μ(α) καὶ
 ἀπ(ί)σ(α)ς γ(ό)μ(α) καὶ γ(ό)μ(α) πε
 τ[αυτῶν] ἀπὸ α
 15 ἔχει Μ... ἀπὸ
 Μ... ἀπ(ί)σ(α)ς
 γ(ό)μ(α) μῆ

The distance between the two accounts was 0.5 cm. At the bottom of II 20 a few lines may be missing; II 21 on the contrary is complete (the lower half of fragment B, verso, is blank).

II 20 5. The name of the month ought normally to be Payni. If the author has written Pharmouthi 24 (which is a possible reading ¹), he has made a

(1) [Φα]ρμ[ου]θ[ι] 24.

mistake, for there is no connection between II 2, 6-10 (recording Philb's deliveries to Phanamios on 1st Pharmouthi of the 8th year) and II 20, 2-4, 6-7, 9, 11, 13, 29. The abbreviation χ , repeated in it probably means $\tau\acute{o}\nu \alpha\upsilon\tau\acute{o}\theta$. Cf. II 9, 18 and 21.

The account is connected with II 19 and gives a survey of the provisions, received by Phanamios on account of the 9th year. They were to cover the consumption of II $\beta\acute{o}\lambda\epsilon$ during the period extending from 15th Payni until 30th Hathyr (cf. II 19, 7). Phanamios' receipts amounted, according to II 20, 22, to 810 *gama*; the total of consumption does not seem to have been calculated by the author in II 19, but can easily be computed: 1 *gama* 2 *ankahai* = 170 = 710 *gam*, 30 *ank*.

2. $\gamma\acute{\epsilon}\mu\alpha$ 52 and 20; $\gamma\acute{\epsilon}\mu\alpha$ 47, both delivered by Philb, remind us of the amount of Philb's 'additional deliveries' in II 2, 6, 8, 11.

11. *Tuproēlēz*: may be an alternative spelling of *Touroēlēz* (?). We do not know whether the person in question belonged to the category of producers or to that of *stablilai*.

II 21 11. 1 *protophō* 14 Between 14 and 15 a symbol, resembling Ω ; we ignore its significance. 16 *ēxai* either refers to Menas (*ēxai* *parroē*), or to the nature of the delivery. The latter is more likely.

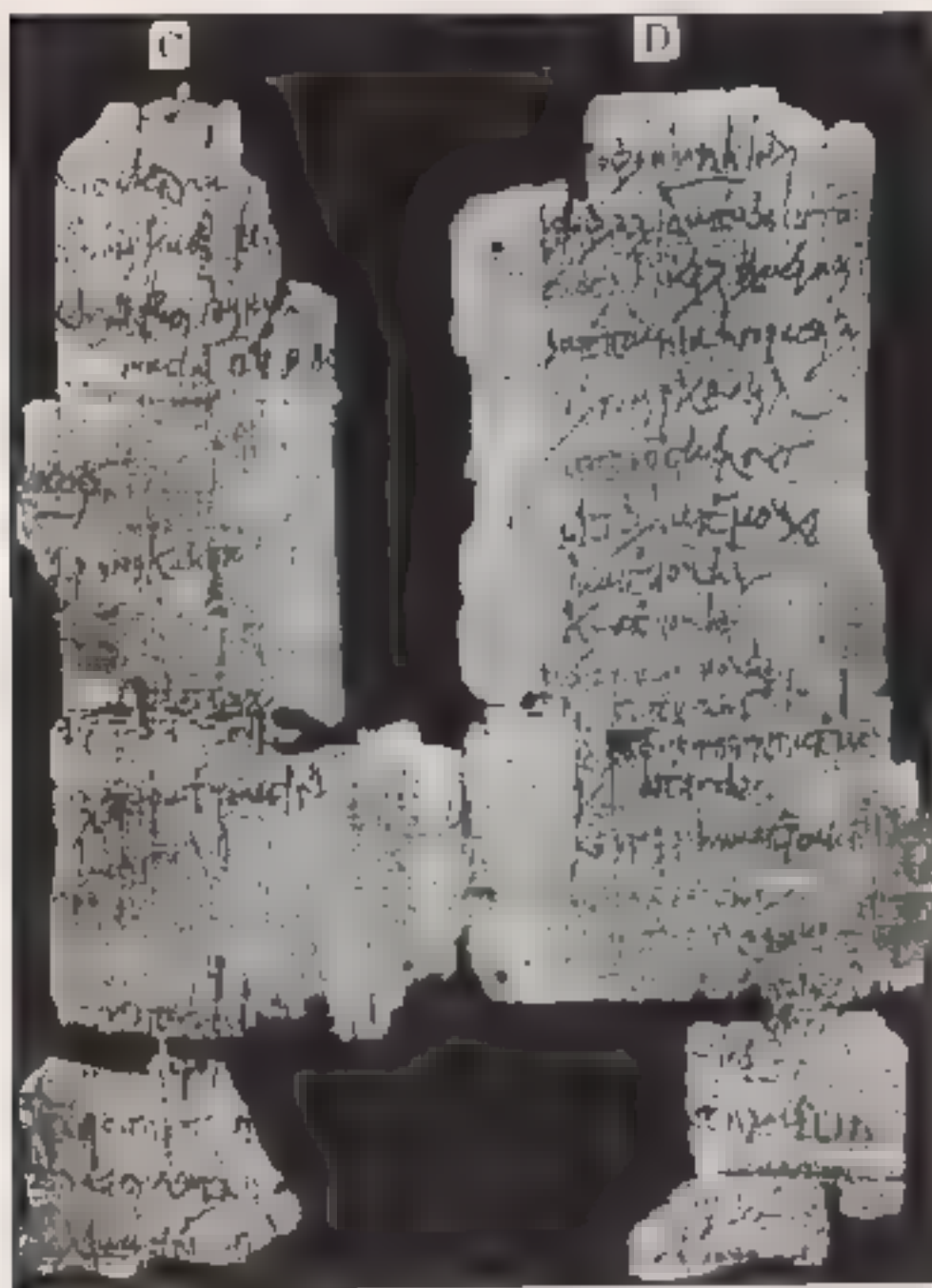
TRANSLATION:

Feeding of 7 -- bulls, receiving 25 bundles, during 74 days extending from 1st Pharmouthi until 14th Payni, at a daily expenditure of 3 loads 25 bundles: 259 loads. They have taken delivery, until the same day, of 422 loads and (have also received) 22 loads from Philb, the labourer; surplus: 85 loads of hay. Feeding from 15th (Payni) onwards: Mo. . . has received from Menas . . . 18 loads.

2. The abbreviation after $\tau\acute{o}\nu\sigma\theta\epsilon\iota$ probably contained a specification of the troop that would be dealt with in the account. Two troops of bulls were kept by the estate at To Skelos.

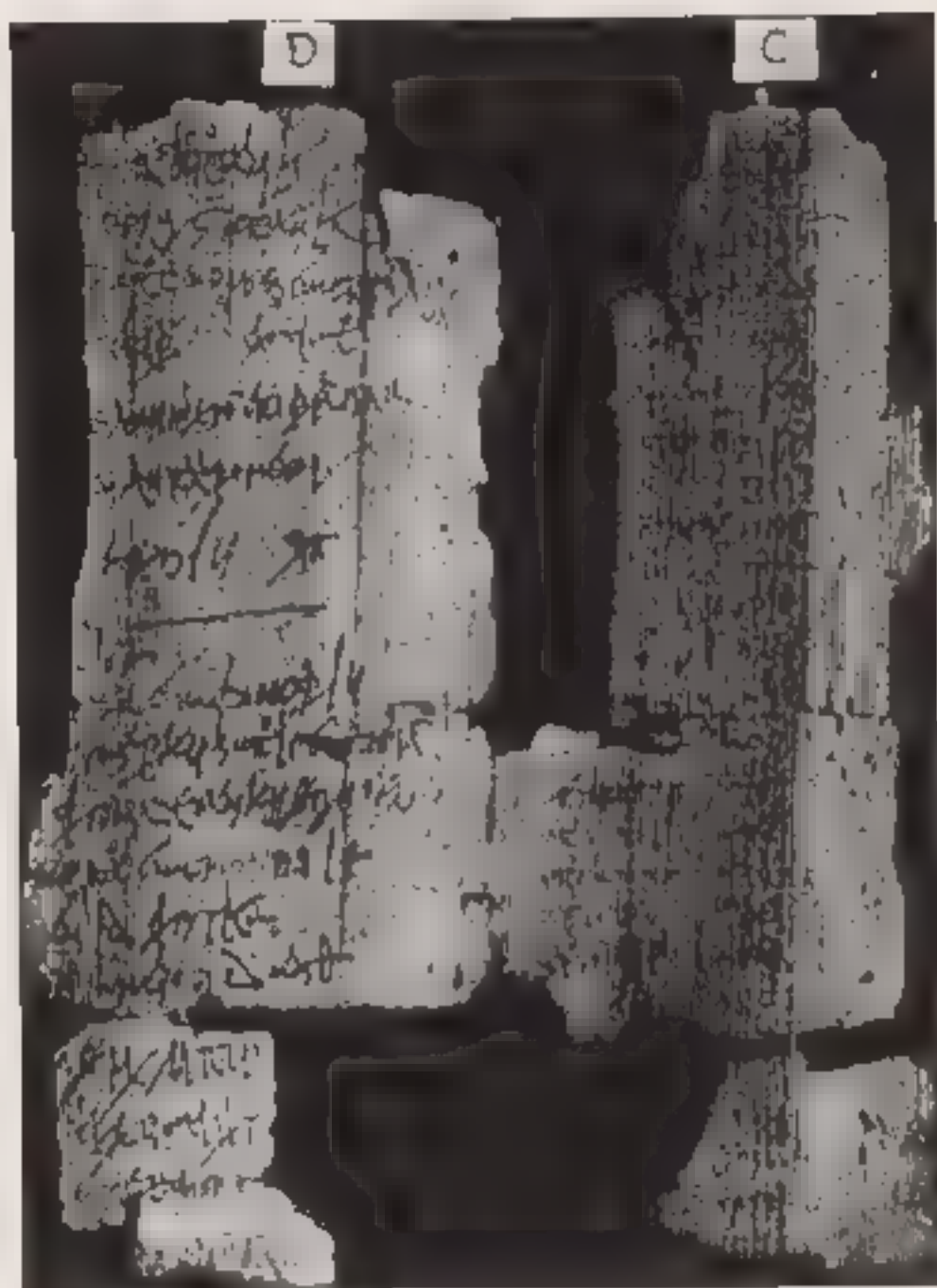
(1) Cf. POESIOKE'S *Nomenbuch*, s. v. The name was borne both by men and women.

PLATE III



SECOND SHEET, SECTIONS C AND D, RECTO
(Accounts II 7. 8 and 9)

PLATE IV



SECOND SHEET, SECTIONS 4 AND 5, VERSO
(Accounts II 18, 19 and 20)

top. The problem will be for 2nd cl. (see 1 in our commentary). 3. after *2m*; a *2m* of might be read. If this is the case, whether the witness has been interrogated or not, is not clear. 4. *2m* is not a *2m* but has not been equiplaced with the others. 5. the *2m* has no other status mark; the word may have been written *2m*?

TRANSLATION:

Feeding of *r* from 1st Pharmouthi until 30th Pappi, at a daily expenditure of 1 load . . . loads. They have received (on account of Eprephi) from . . . until 1st Mesore (2 load) = 16 loads, 10 bundles, from . . . until . . . loads, from Phab until . . . loads, from . . . until on . . . 4 loads, and again from the same village (1) 3 loads, from . . . until on . . . loads, from Boussres on 30th Mesore, 24 loads, from . . . on . . . loads, from Boussres on 30th . . . 30 loads, from . . . on . . . loads, from Iakoh on . . . 8 loads. In all: . . . loads. The copying of the accounts has been completed.

The provisions received for *gouren* *gouren* during Pharmouthi-Pappi seem to have been recorded on sheet 1, for the present account has no connection with any of the accounts of receipts that are known to us. In this respect II 22 resembles the previous account.

2. From *gouren* onwards, anticipation of the 50th year, *gouren* but 1. *gouren* (2) is not convincing, for each of these animals would only have carried 1 *gouren*, 20 *gouren*, whereas a donkey-load amounted to 4 *gouren*. If the number of *gouren* equivalent to 12 (*gouren* but 1) were 18 (instead of 16) one might think of *gouren* (2) (used, *gouren*). Whatever the solution of the abbreviation may be, it probably refers to a term of the same category as *gouren*, *gouren*, *gouren*, *gouren*, *gouren* etc.

4. *gouren* : *gouren*?

7. *gouren* : he probably belonged to the *gouren* of the domain. Quite a few staldemen bear Jewish names : Abraham, Isakos, Elias, Jakob.

8. *gouren* either refers to the accounts that were the basis of the author's information (cf. p. 38), or to the general account, drawn

up by the author (4). In the first case $\delta\alpha\pi\pi\epsilon\pi\tau\epsilon\phi$ would mean 'transcript, list', in the second 'reduction'. The first solution is to be preferred, because II 22 did not constitute the end of the author's accountancy, cf. our commentary on II 23.

II 22	$\left. \begin{array}{l} \dots\epsilon \\ \dots\tau \\ \dots\epsilon \end{array} \right\} \dots$	II 24	$\delta\alpha\pi\tau\epsilon\phi \quad \tau\alpha\phi(r) \quad \delta\tau\alpha\phi \quad)$ $T\alpha\phi i \quad (\delta\pi\epsilon\phi) \quad \tau\alpha\pi\alpha\phi\epsilon\phi \quad (\beta\alpha\phi(r))$ $\dots\epsilon\phi \quad)$
-------	--	-------	---

II 22 Only a few letters of this account have survived. They belong to the right extremity of a papyrus fragment which was probably cut at II 22 at a distance of 2.5 cm. from the right edge of section 2 and extended over 7.5 cm. It probably covered a considerable part of the lower half of section 2.1

In our opinion this account gave a summary of the expenses that had been recorded on sheet 11. It is less likely to have summarized the expenses recorded on both sheets.

II 24 1) $\delta\pi$ T $\alpha\phi i$: This is the only case in which $\delta\pi$ cannot be interpreted as a preposition. The abbreviation probably has the same meaning as $\delta\pi\tau\alpha\phi$ (II 1, 8 and II 2, 30; $\delta\pi$ II 1, 130; $\delta\pi\tau\alpha\phi$ II 2, 17) $\delta\pi\tau\alpha\phi$ (II 7, 2). Only the two capitals $\tau\alpha\phi$ of this account, and traces of its third line have been preserved. The third line may have contained a specification of the $\phi\alpha\phi$ in question.

II 24 obviously intends to repair an omission. The account probably dealt with the second and third troop of $\phi\alpha\phi$, whose maintenance during year 8 had been the subject of a lost account in section 8 verso (dealing with Pharmouthi-Payni) and of II 16 (dealing with Phaophi-Flathy). II 24 may have given a survey of the provisions that had been received on account of year 9, a subject which the author should normally have treated in connection with his accountancy of the animals' maintenance during Pharmouthi-Payni.

(4) In P. Oxy. 257 (725 A. D.) $\delta\pi\tau\alpha\phi\epsilon\phi$ means 'accountbook'.

CONCLUSION

The most interesting features of *P. Land. 653* are undoubtedly the following: first of all, its data about stall-feeding and more particularly its abundant details on daily rations of hay, a subject on which Greek papyri had yielded, up to now, very little information; in the second place its provenance from the accountancy-office of an estate which was connected with sister-domains, scattered all over the Division of Polemon, and its information about the co-operation between these domains (exchange of agricultural products and of animals); finally its methods of accountancy, revealing a certain decline in the professional training of clerks.



INDICES

1. INDICATIONS AND MONTHS

- α ἰνδακτιος (ind.): II 1, 16;
 ζ ἰνδακτιος (ind.): I 1, 6; II 9, 17;
 η ἰνδακτιος (ind.): I 1, 2; II 2, 1;
 II 7, 3; II 8, 1; II 9, 1; II 15, 2;
 II 19, 1.
 θηθή: 8th year: II 6, 1; II 19, 2.
 Φαδὴ (phad): 8th year: II 6, 1
 & 2; II 6, 4; II 16, 2; II 19, 2.
 9th year: II 9, 22.
 Ἀθήρ (athēr): 8th year: II 16, 3 &
 5; II 19, 1.
 Χίους: 8th year: II 1, 7.
 Φέρμενθ: 8th year: II 1, 2.
 Φαρμαθήσμεν (pharmathē): 7th year:
 I 6, 1; 8th year: II 2, 2; II 19,
- I 3, 5; II 14, 1; II 18, 3; II 19, 5;
 II 21, 1.
 Ηρόρ: 8th year: II 9, 3; II 19, 3;
 II 19, 1.
 Ηδέρ (hēr): 7th year: I 1,
 33; I 6, 3; 8th year: II 9, 4;
 II 18, 3; II 19, 5; II 21, 1.
 Τεύ (teu): 8th year: I 2, 1 & 5;
 10, 2; II 1, 5 & 13; 9th year: II
 9, 7; II 18, 6; II 19, 4 & 5.
 Μεσση (messē): 8th year:
 I 7, 2; 3, 5 & 9; II 1, 6; 9th
 year: II 9, 10; II 16, 6; II 22,
 2 & 5.

2. PERSONAL NAMES

- Ἀνίας: II 1, 9.
 Ἀβραία: II 5, 2; II 9, 16 & 23;
 II 11, 2.
 Ἀράθης: II 1, 14.
 Ἀσας: II 7, 1 & 5; II 8, 5.
 Βίκτηρ: II 2, 13.
 Ἠλίας: II 5, 5; II 6, 5; II 8, 5;
 II 20, 10.
 Ἰακώβ: II 24, 7.
 Ἰονθιανός: II 1, 11 & 13.
 Ἰσάκιος Ἰσάκιοι, ἰσάκι: II 1, 15;
 II 7, 1; II 9, 14.
 Μασιογρός: II 1, 1.
 Μητός: I 1, 3; II 1, 5 & 12; II 5, 4;
- II 9, 14, 16 & 21; II 11, 5; II 21, 10.
 Νεῖ: I, II 21, 10.
 Παλίκος (palik): 8th year: I 1, 9;
 II 8, 1; II 20, 5.
 Πατακίανος (patakian): I 2, 1.
 Πεδός: II 1, 1.
 Σαφίμος: II 5, 3; II 11, 2.
 Τεσσάρης: II 20, 14, 16 & 19.
 Φαττακός (fattak): II 2, 6 & 9;
 II 20, 1.
 Φαβ: II 2, 1; II 20, 2, 6, 9, 11, 13
 & 20; II 21, 11; II 22, 3.
 Φοιβαρμικός (foivarumik): II 8, 2; II
 9, 1; II 11, 4.

3. GEOGRAPHICAL

Βαλκάνες (Balkan) : II 9, 8, 9, 19,
11, 13 & 15; II 19, 6; II 12, 5;
II 18, 7; II 29, 12, 15 & 17; II
22, 3 & 6.

Θαλάσσιος (Thalassios) : II 29, 8.

Κίος : I 1, 7.

Κέραια : II 12, 5.

Μαίνα : II 3, 1, 2 & 3.

Μεσσηνία (Messenia) : I 1, 12; I 6, 7; II
9, 7, 12 & 15.

Παλιόβ. (παλιόβ.) : I 1, 1; II 5, 1;
II 11, 1.

Ράδι : I 6, 8 & 12; II 12, 4; II 24, 2.

Τε. Σελήνη : I 6, 7; II 9, 6; II 12, 2.

Τοῦ Μελισσανίου (τοῦ μελ., τοῦ μελισσ.) :
II 9, 19 & 20; II 20, 16.

4. SYMBOLS

$\frac{1}{2}$ = *αιών* : *proetum*

$\frac{1}{3}$ = *ἀγορά* : II 2, 1 & 16; II 7, 4;
II 11, 8; II 13, 6; II 16, 7; II 19,
4 & 8; II 20, 22.

$\frac{1}{4}$ = *ἀγορά* : *proetum*

$\frac{1}{5}$ = *ἀγορά* : *proetum* : II 1, 2, 7 &
8; II 2, 19; II 9, 2.

$\frac{1}{6}$ = II 1, 1; II 7, 1; II 9, 1; II 10,
2; II 21, 1.

5. MEASURES AND WEIGHTS

ἀργύρεα (argyrea) : II 6, 2; II 9, 2 & 5;
II 10, 1 & 9; II 13, 3 & 4; II 14,
2; II 16, 1 & 6; II 17, 1; II 18, 3
& 2; II 19, 1, 6 & 7; II 21, 2 & 6;
II 22, 2, 11 & 19, 11.

γρόμοι (gromoi) : (σταθ.) : I 1, 3, 4, 5, 6, 8, 10
& 12; I 2, 1, 2, 3, 4, 5, 6, 8, 9; I 4,
3 & 4; I 6, 7, 8 & 9; II 1, 1, 2, 3,
10; II 2, 2, 3, 4, 5, 6, 7, 8, 9, 19, 11,
12, 13, 14, 15 & 16; II 5, 2 & 3;
II 6, 2; II 7, 2, 3, 4 & 6; II 8, 3, 4,
& 5; II 9, 3 & 5; II 19, 3, 6 & 7;

II 14, 2, 3 & 4; II 13, 1, 2, 3, 4;
II 14, 1, 5 & 6; II 15, 3 & 4; II
16, 1, 4, 6, 7; II 17, 1, 2; II 18, 5,
6 & 7; II 19, 3, 4, 6 & 10; II 20,
2, 19, 22; II 21, 6, 7, 10, 12, 13 &
17; II 22, 1, 2, 4, 5, 6, 7.

καταστάσεις (katasatais) : II 2, 6, 8, 11,
proetum : II 22, 2.

κατάστασις (katasatais) : II 15, 4.

μετρήσιμα (metresima) : II 2, 14; II 11, 6;
II 12, 1, 2, 3, 4 & 5; II 19, 8 & 11.

6. GENERAL INDEX OF WORDS

ἀγορά : I 1, 7.

ἀγοράζω (agorazō) : II 9, 4.

ἀγοραστός (agorastōs) : I 1, 2
& 11; II 3, 2.

$\sigma\sigma\epsilon\epsilon\zeta$, $\sigma\sigma\epsilon$ = II 4, 1

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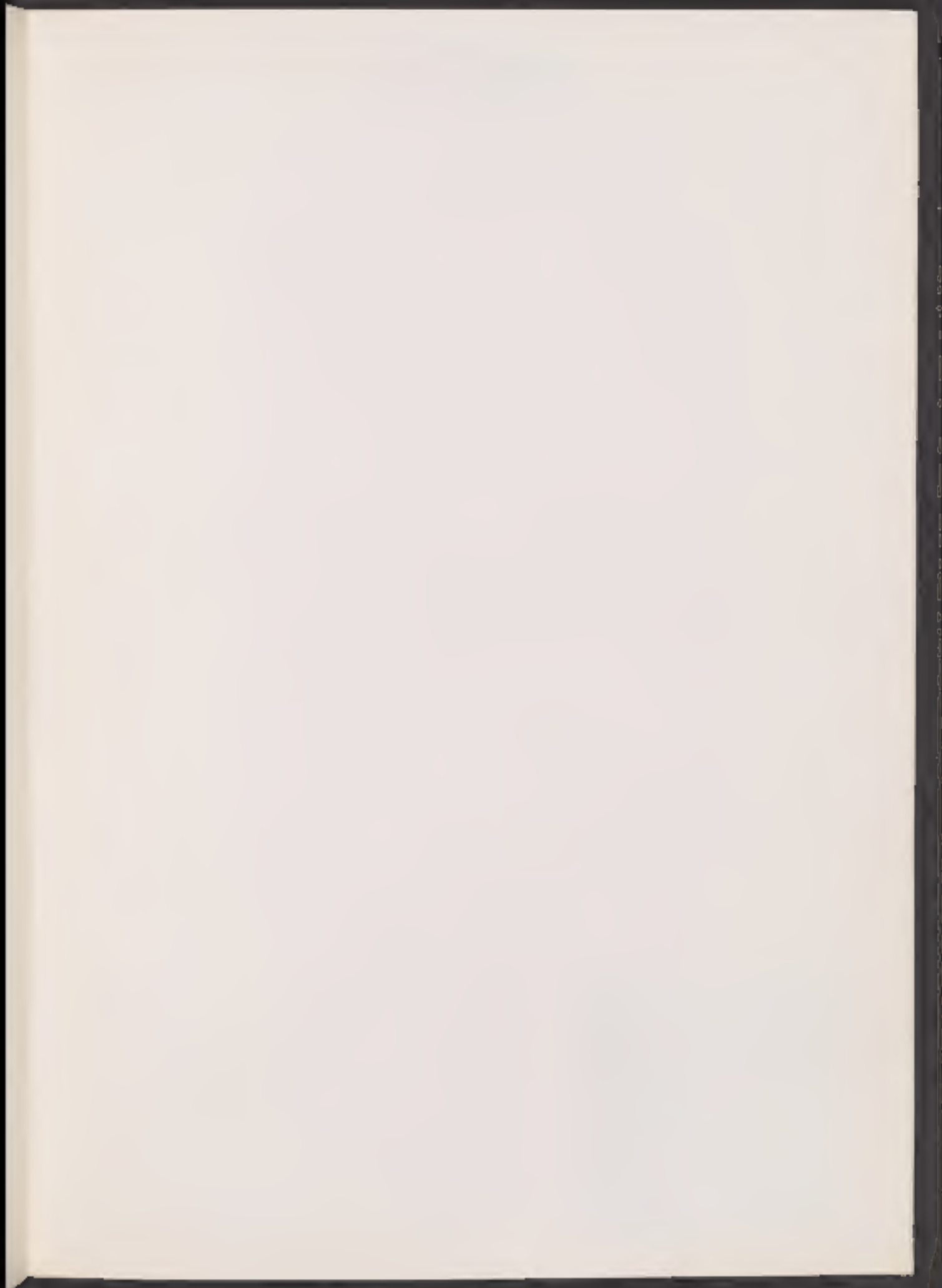
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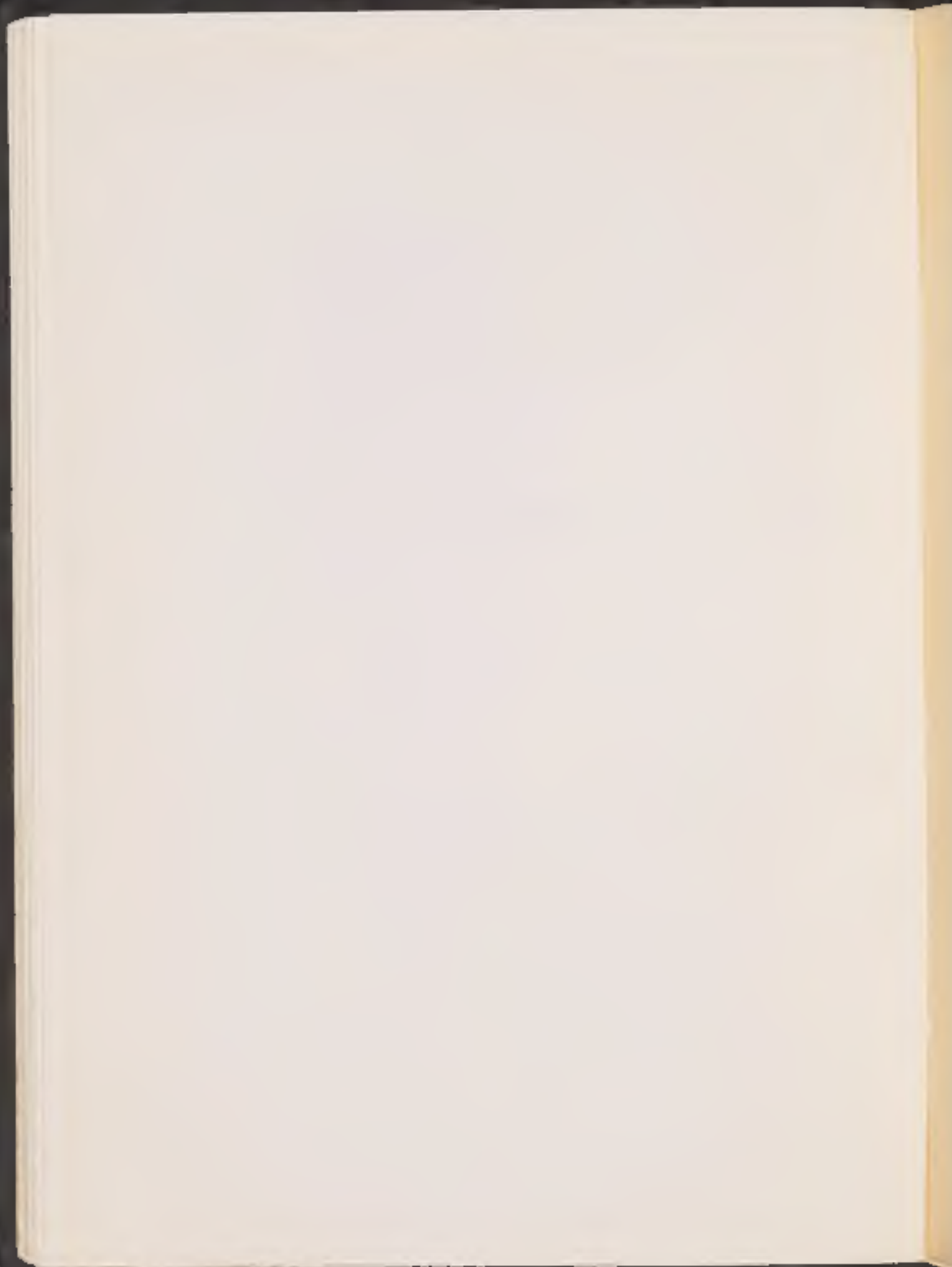
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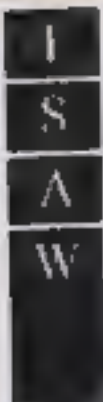




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